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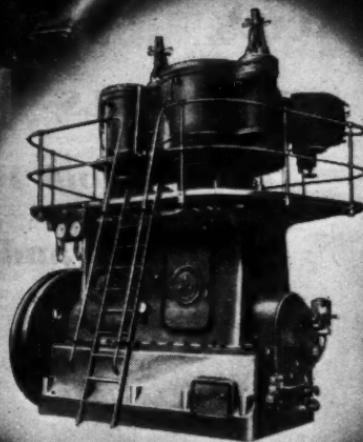
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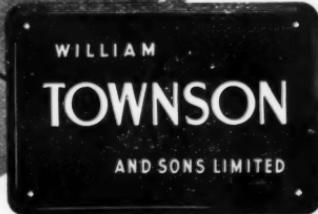
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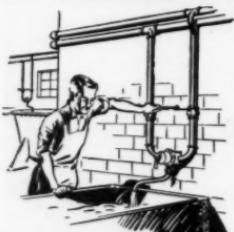
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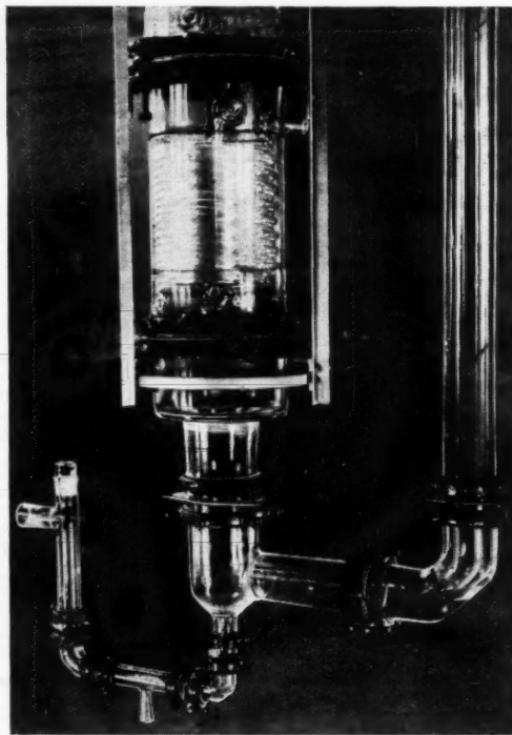
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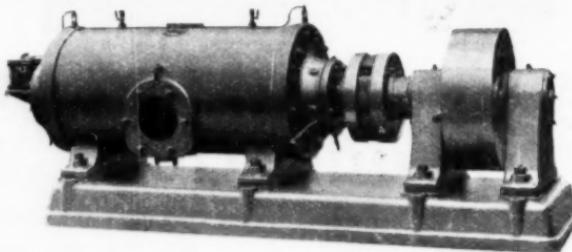


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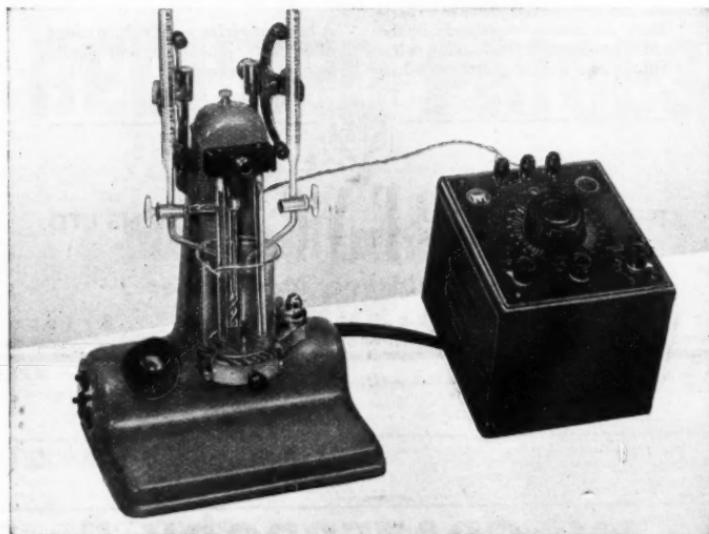
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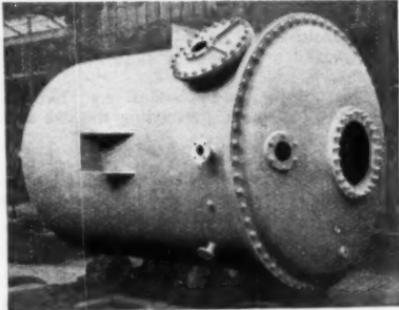
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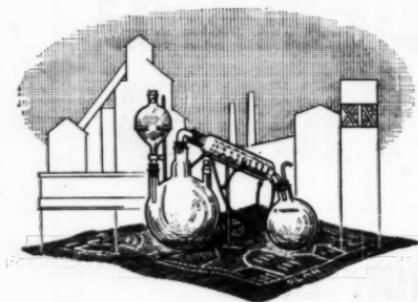
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No. 1508.

5 June 1948

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## A Clear Verdict

WE have long been aware that we are not alone in contending that the increasing centralisation of the forces through which our industries and consequently our economy are controlled has already passed the point at which any benefits can accrue. In the recent observations at shareholders' meetings by leaders of chemical and associated industries there has been testimony that familiarity with controls of all kinds has done nothing to instil confidence in the principle.

Here objection has necessarily been presented only as expressions of opinion: from Australia this week came evidence of a more forcible kind that a great body of electors—who, be it noted, have much longer experience than we of highly centralised authority in their affairs—want no extension of the system. This significant pointer to the trend of events was provided by the outcome of the referendum on the proposal to amend the Australian constitution to transfer from the States to the Commonwealth the power to control prices and rents. The voting, 2,119,818 against and 1,539,997 for the proposal, and the fact that all six States solidly opposed it, represent a change in popular sentiment which could, we believe, as readily be demonstrated here.

There is in this country at the moment an increasing tendency to ask how far is present government control of industry and economic affairs necessary and how far is it a political expedient? Control has been made possible through the short-

age of raw materials and even more so through the shortage of foreign currency in this and most other countries of the world. Control through licensing appears under these conditions to be defensible, and being defensible is accepted by most people passively; but it is in those conditions that the elaboration of still further controls becomes a certainty. Since all nations, except the U.S.A. and a very few others, are in something of the same sort of position that we are, the policy is defended on political grounds of doing business by and between governments rather than between individuals on traditional lines. Governments, on this argument, know what goods or services the country needs and whence to obtain them. They know what means the nations have of buying what is required and, operating like Zeus from a remote Olympus, decide what goods should be exported and to where, who shall be allowed raw materials and labour and for what purpose, what shall be bought from abroad and where it shall go, and what shall be the cost of production and the price to the consumer. In a phrase, the government charts the course, industry mans the bridge, and everyone hopes that the ship will come safely to port.

All this pre-supposes the possession by the governments concerned of an almost divine prescience so that mistakes are impossible. But have we not seen in this country two major mistakes already? One was that, although industrialists and economists could plainly foresee the immin-

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ment gap in the balance of payments, years of precious time have been lost in pursuing vast nationalisation projects and schemes of social welfare, so that in effect we fiddled while the flames gained their hold. The other miscalculation was in regard to the beneficial results to be secured from the American loan. These and several other evidences of the inability of "global" planning to serve urgent economic needs entitle us to seek means of achieving our purposes other than by direct government management of industry.

If you abandon controls, it is frequently asked, what would you put in their place? The answer to that question cannot be given if present conditions are accepted as permanent. In answer to the contention behind it, it can be pointed out that this country has been committed—unlike some other countries—to rationing and conditions of scarcity ever since the war ended. It may well be asked whether those conditions have been deliberately imposed in order to make control possible.

Government can, and should, help industry in various legitimate ways through advice and consultation on matters of policy, assistance through consular offices abroad and through the Board of Trade at home. But one of the oldest and most experienced of proverbs is that the cobbler should stick to his last: that the expert jobs should be done by experts. We have

already seen abundantly the difficulties of planning in a free community. May it not be that the time has come to give private enterprise a chance, while setting up consultative machinery in all industries, such as that formed in Scotland last week to enhance the productivity of the shale oil industry?

What has happened in Australia provides in a limited sphere a lesson which all our advocates of "remote control" should study attentively.

### Shale Oil Production Committee

A joint production committee for the shale mining industry is to be formed. This decision is stated to have been made on the initiative of the National Union of Shale Miners and Oil Workers, which approached Scottish Oils, Ltd., suggesting that a good deal could be done to improve efficiency and output by the establishment of a committee of the kind for the industry.

The committee, consisting of five representatives from the employers' side and five from the union, will be headed by a Scottish Oils nominee. Its activities will be confined at first to the Westwood and Burntgrange mines. A regular exchange of views between the management and workers on matters relating to production and efficiency will be encouraged and recommendations made. Trade union matters will not be discussed.

## NOTES AND COMMENTS

### South African Industries

**S**OUTH Africa's emergence from a state of obscurity, seen as a source of chemical production, has been almost startlingly rapid. Associated with the abundant news of new industries attracted by the comparatively recent recognition of the country's generous endowment with raw materials and coal have been a number of important U.K. interests which saw in the Dominion scope to implement some of those chemical activities not easily developed in existing conditions here. It is fair to assume, however, that few can have foreseen the overthrow, almost overnight, of a Government which seemed in no imminent danger. In view of the wartime policy of the new Premier of South Africa, and of some of his associates, the new schemes for chemical development in the Union, having in many cases their roots in this country, seem bound now to feel the effects of a less friendly political climate than they had cause to expect, which the deep-rooted philosophy of the Afrikander supporters of Dr. Malan will render no more genial. Theoretically the prospect for the industrial pioneers is gloomy only if disproportionate attention is paid to the new Premier's former adherence to Republicanism, the possibility of currency restriction between South Africa and this country and the disturbances that an attempt to reverse the more liberal policy in native affairs might produce. In reality, the minuscule majority conferred on Dr. Malan is likely to be an assurance that there will be no widespread revolutionary attempt to set back the clock, especially in respect of those newer industries for whose products there is so evident a need throughout South Africa and receptive markets farther afield.

### Off Duty

**I**F, as the chairman, Mr. G. M. Leonard, tentatively suggested, last week's annual general meeting and luncheon of the Chemical Engineering Group of the Society of Chemical Industry, is to set a precedent and future gatherings are to be transformed from marathons of learned exposition to occasions for indulgence of pleasant and wit, few members will complain. The popular conception of scientists as a race apart, browsing remotely in

intellectual pastures, was completely routed at this year's assembly. Even official pre-lunch business concerned with the presentation of reports and the election of officers was enlivened with good-humoured banter and verbal swordsmanship. The sprightly mood gained momentum as lunch proceeded and the Royal toasts, were, in fact, the only intrusions of solemnity, which the principal guest, New Zealand's High Commissioner, was at pains not to prolong. Scientists, engineers and technicians greeted his sallies with almost Rabelaisian gusto. It is a reassuring token of a balanced outlook when hard working chemists and engineers, many distinguished in their own fields, can amply demonstrate to the world at large a healthy capacity to unbend.

### Inflated Prices

**T**HE extraordinary increase in this country in prices of many chemical raw materials, contrasted with 1939 levels, is "unparalleled" only in a strictly insular view. The truth of this is proclaimed just now by the commentary of the chemical journals of many countries, excluding possibly the U.S.A., where the discrepancy between the steep rise in production costs and the relatively modest price increase of one or two basic chemicals has been given a good deal of publicity. In most Continental countries it is manifest that prices are no easier than ours and there are whole categories of chemical materials of which present values bear little relationship to pre-war charges. This is one of the more pressing problems of chemical industries in Spain revealed by *ION (Review Espan. de Quim. Aplicada)* which has lately published the results of a questionnaire directed to the perfumery and associated industries. Much of the evidence produced is that raw materials of those industries are often either unobtainable, or if available are of poor quality and priced at black market rates. Imported materials head the towering price structure, patchouli, for example, which in 1936 cost less than 100 pesetas a kilo, now having achieved a 30-fold increase. Spain, however, is fortunate in being capable of producing a wide range of essential oils at home or in

her overseas territories—lavender, rosemary, sage, rue, fennel and thyme and a number of colonial products, the fuller exploitation of which is now being planned. Spanish industry is becoming increasingly interested in the rich return which may be obtained from sources such as the high quality lemon grass of Spanish Guinea, the cedars of Atlas, geranium oil from Réunion and cloves extremely rich in eugenol. Spain is now aware that by scientific cultivation of overseas plantation she could become to a large extent independent of some overseas supplies. In her present situation of semi-isolation in world affairs she is finding increasing encouragement "to cultivate her own garden"—small though that garden is by British Commonwealth standards.

### Whoops

**O**DD and very complex are some of the results of our best intentioned endeavours to regulate—which we usually call "regularising"—other people's commercial principles. Recent rulings about ad-

vertising of proprietary medicines, justified as was the principle by a few notorious "wonder cures," have not been devoid of the familiar odour of red tape which usually betokens straining at the gnat. But our own brand of pedantry seems to be almost broadminded when compared with some of the effects of a Patent Medicines Act which operates in Australia, or at least in New South Wales. There, the advisory committee which examines all relevant advertising has been wrestling with the description of a preparation "for the relief of whooping cough" and, figuratively, they have thrown it right out of the ring. It appears now—according to *The Pharmaceutical Journal*—as a preparation "for the relief of the cough of whooping cough." The whoops remain; indeed, following this masterly exercise in exact description—a combined operation by a pharmacist, a pharmacologist, a manufacturer's agent and a departmental medical officer—they may well have reached epidemic proportions.

## TRADE ASSOCIATIONS

"**W**e are members of a number of trade associations, and are not ashamed to say so. If you want to be rude about a trade association you call it a cartel or ring," said Mr. G. Leslie Wates, chairman of Johnson & Phillips, Ltd., when he addressed the 43rd annual general meeting of the company in London recently.

Remarking that in the U.S.A. there was legislation of a penal nature, associated with cartels, he recalled that in this country too, certain legislation was being considered. While in broad principle, he welcomed that, he contended there was much virtue which should be known, and such opportunities for evil as might exist were best controlled by publicity. The test of any trade association should be the answer to the simple question: "Is it harmful to the community?"

From various public statements, the chairman concluded, that in some quarters competition in prices was supposed to be the solution of all problems of trading from this point of view, but suggested that if there was a reasonable and proper price fixed which showed a fair margin of profit to the efficient trader, there would certainly be competition in quality which was the best possible stimulant to efficiency in the factory.

## PRODUCTION NEEDS

**B**UILDING restrictions, more especially in W. J. Bush & Co., Ltd., undertaking extensive developments outside the Metropolis, said Dr. P. C. C. Isherwood, chairman and managing director, speaking at the recent 51st annual general meeting. A new factory had been built at Witham, Essex, and considerable extension was proceeding at the Widnes factory.

### Restricted Supplies

Dr. Isherwood hoped that British industry would soon be permitted a reasonable opportunity of extension by a greater release of supplies of steel and other materials. A freer granting of building licences was also needed. Only when that took place could the large amount of work successfully undertaken by chemical and engineering research staffs be translated into large-scale production.

Too much stress could not be laid on the importance of increasing technical efficiency in order to meet the growing competition of countries better placed to obtain up-to-date plant, which competition, he feared, would be increasingly experienced by British exporters.

# RADIOACTIVE SUBSTANCES BILL

## Mr. Bevan on Need for Safeguards

THE primary purpose of the Bill—said Mr. A. Bevan, when the second reading was given last week in the Radioactive Substances Bill—was to secure protection for the health of workpeople and of the public generally against the harmful effects of undue exposure to dangerous radiation. There had been a disposition among some people, when the first Bill—subsequently withdrawn—had been introduced, to say that the safeguards were unnecessary. Experience of X-rays had lasted about 50 years and the complete ignorance of their effects had now been overcome by modern education. Scientists and doctors were normally educated in their dangers. But education did not remove the need for the Bill.

In medicine, X-ray sets had reached 250,000 volts and betatrons might shortly generate 30 million volts. As a by-product in nuclear research, and particularly of the great atomic piles, artificial radioactive substances—such as radioactive cobalt, radioactive iodine, etc.—were becoming freely available for therapeutic use. These substances had tremendous possibilities and, of course, dangers. The Minister understood that all had different rates of emission, and other characteristics, and were difficult to define. This had led to the rather unusual structure of the Bill.

### Main Provisions

Clause 1 would empower the Minister of Supply to acquire, process and distribute radio-active substances, while Clause 2 related to control by the Minister of imports and exports of the materials when present legislation ceased. Clause 3 dealt with administration to human beings, and the provision of safeguards for the public in that respect. The effect of Clause 4 was to re-

quire anyone using irradiating apparatus to obtain a licence.

Under Clause 5, regulations could be laid down for the protection of workers in industry, and in effect extended the provisions of the Factories Acts. It also covered hospitals, laboratories and transport.

The same regulations also dealt with effluents where radioactive substances were produced. The height of chimneys or treatment or segregation of effluents where they were poured into rivers or on to the land would also be covered. This, said Mr. Bevan, was an extremely important aspect, because the by-products from these piles and many of the elements with which they came into contact, could be considerably radioactive for a considerable time, and unless proper protection were given, very serious dangers might result.

### Advisory Committee

From time to time, regulations would have to be amended, and a powerful advisory committee would be appointed for the purpose. Among bodies to be invited to discuss membership of the committee, Mr. Bevan listed the Medical Research Council of the Royal Society, the Physical Society, the Faculty of Radiologists, the Department of Scientific and Industrial Research, the British X-ray and Radium Protection Committee, the British Employers' Federation, and the T.U.C.

The Minister said the Government would not attempt to fence the scientist in, and to subject him to restrictions which were only intended for persons without his knowledge. The Bill would arm the scientists themselves with the powers to say what they thought ought not, or ought, to be done.

## CHEMICAL REPARATIONS : AMENDED LIST ISSUED

CERTAIN amendments have now been made by the zone Commander in the list of 39 chemical plants available as reparations from the British Zone of Germany (THE CHEMICAL AGE, November 22, 1947).

Serial B/S/128, Dynamit A.G., Troisdorf, is now amended to read, "part plant comprising (a) the section for the production of nitro-penta; (b) part of the section for pressing plastics; (c) part of the section for the production of phenoplasts and (d) part of the section for the production of celluloid."

Serial B/S/138, Oxo-Gesellschaft, Oberhausen, now reads, "part plant, comprising 50 per cent of the capacity as a complete working unit for the production of higher aliphatic alcohols," and all reference to substitution mentioned in the Board of Trade Journal (January 24) is now deleted.

The following addition to the list should also be made, Serial B/S/501, Ruhr-chemie, Oberhausen, Halten, part plant comprising the section complete with instruments for the production of toluene from heptane-octane.

# Government Disposal of Surplus Drugs

## General Release Without Public Safeguards

A PRESS notice issued this week by the Association of British Chemical Manufacturers reveals that the Ministry of Supply has recently given notice to the Pharmaceutical and Allied Chemicals Disposals Association, Ltd., of its intention to terminate the agreement covering the methods for the disposal of Government surplus stores of pharmaceutical products.

One of the fundamental principles for which the association was formed, observes the ABCM, was the safeguarding of the public generally against dangerous or useless medicinal products being unethically or indiscriminately circulated. There will thus now be no adequate safeguard.

In future, the Ministry of Supply will offer surplus stores on open tender. It will decline any responsibility for the condition of the goods and make this the sole responsibility of the buyer.

Most of the goods offered will bear the names of reputable manufacturing houses, and, consequently, some buyers may con-

sider the purchase of lines which they would otherwise not touch. Many of the items offered are now several years old and little is known of the conditions of storage, etc., but age alone will render some products useless or even dangerous.

The companies listed below wish to bring these facts to the notice of potential buyers and to make it quite clear that the appearance of their name against any items must in no way be taken to imply any guarantee or indication of the suitability of the products for any purpose whatever:—

Allen & Hanburys, Ltd., Boots Pure Drug Co., Ltd., the British Drug Houses, Ltd., Burroughs Wellcome & Co., W. J. Bush & Co., Ltd., Co-operative Wholesale Society, Ltd., Duncan Flockhart & Co., Evans Medical Supplies, Ltd., The General Chemical & Pharmaceutical Co., Ltd., C. R. Harker, Stagg & Morgan, Ltd., Johnson & Sons Mfg. Chemists, Ltd., May & Baker, Ltd., Roche Products, Ltd., Savory & Moore, Ltd., Sharp & Dohm, Ltd., T. & H. Smith, Ltd., and Wright, Layman & Umney, Ltd.

## LABELLING OF DRUGS

RESULTING from discussions between the Association of Anaesthetists, the Association of British Chemical Manufacturers, the Wholesale Drug Trade Association, and the Ministry of Health, various recommendations have been made to operate when production facilities permit—for the labelling of ampoules of anaesthetic drugs. The recommendations include the marking of the ampoule, in the case of a B.P. product, with the B.P. name or its official abbreviation in conspicuous type on the label.

The quantity of preparation in the ampoule should wherever possible be specified, in the case of a liquid, as the volume of the liquid extractable by syringe and, in the case of a solid, as the total weight of the contents. It is pointed out, however, that legislation such as the Dangerous Drugs Act and the Poison Rules require the absolute contents to be stated and not the contents extractable by syringe.

It is also recommended that marking on ampoules should be such as will remain legible throughout sterilisation of the outside surface of the ampoule and during storage in disinfectant solutions.

## U.K. STAFF AT CHALK RIVER

ALL major construction work has been completed on Canada's atomic energy plant at Chalk River, Ontario, the National Research Council reports in its monthly bulletin. About 1000 administrative and scientific staff are working on the project. Forty British scientists, members of the British project at Harwell, are at Chalk River doing research work.

### Radiation Risks

The project, now entirely under the Research Council, has been organised into three divisions and an administrative branch, a research division, an engineering division, and a division which deals with health. It operates a hospital at Deep River village and supervises the protection of staff from dangerous radiation. One of its duties is to keep certain areas free from radioactive materials.

The council states provision has been made for scientists to visit the project during the summer to carry out research in its laboratories. "In this way the project offers to scientists certain facilities which the university cannot provide," it said.

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## U.S. Aluminium

### Continued Large Production Increase

FOR the fourth consecutive month production of primary aluminium at reduction plants in the United States has registered marked increases. During March, production totalled 51,874 short tons, a gain of almost 14 per cent over the 45,699 tons produced in February, and the highest monthly output since March, 1947. A contributing factor was the increased water flow at power generating facilities. Power was allocated for the operation of Reynolds' Longview plant, which had been closed since June, 1947. Prices of scrap and secondary ingot continued at a high level as a consequence of the continuing strong demand for aluminium.

Imports of aluminium ingot during March, all of which came from Canada, were 8,043 tons, or 55 per cent more than in February. Exports of crude and semi-finished aluminium were also at the highest level since last October. Exports of alloy ingot and slab were 278 tons in March, the greater part being shipped to France.

## U.K. CHEMICALS AT COPENHAGEN

**A**MONG the firms participating in an exhibition of British industry, which is to take place in Copenhagen from September 18 to October 3, are the following members of the Association of British Chemical Manufacturers: Albright & Wilson, Ltd., Bakelite, Ltd., W. J. Bush & Co., Ltd., Imperial Chemical Industries, Ltd., May & Baker, Ltd., Monsanto Chemicals, Ltd., Petrochemicals, Ltd., and Williams (Hounslow), Ltd.

These exhibits will be grouped together to form a chemical section in the Forum Building at the exhibition, which is being organised by the FBI.

## More Scope for Public Analysts?

An indication that the Society of Public Analysts may soon change its title is contained in the annual report of the Council of the society. Of three special committees that have held meetings during the year, one is concerned with "the possibility of making a change in the name of the society, with the scope and wording of the memorandum and Articles of Association, with the constitution and method of election of members, and with the method of election of members of council."

The other special committees have been considering the question of improving training in analysis, and relations with other bodies.

## WDTA Title Change

### Manufacturing Interests Represented

**A**T a Press conference called by the Wholesale Drug Trade Association at the Waldorf Hotel on Tuesday, Mr. C. A. O. Rideal, chairman, disclosed that at the annual general meeting on April 7 it had been decided that the title of the association should be changed to "The Association of British Pharmaceutical Industry."

For some time members had felt that the old name was not truly representative of the association's activities, since it tended to over-emphasise its wholesaling interests to the exclusion of manufacturing activities. It was hoped, said the chairman, the new name would convey to Government departments and other bodies the true scope of the association's interests.

Launched in 1891, when it was known as "The Drug Club," the association's membership and influence increased steadily until 1929. In that year, when its members totalled about 30, it assumed the name of the WDTD. There were now 148 firms represented.

## New Health Service

Discussing the effects of the National Health Service, Mr. Rideal said he saw no difficulties in the way of maintaining adequate supplies of drugs and medicines to hospitals and retailers. Containers—in particular, bottles—were not last year in adequate supply. The position had now very considerably improved.

Simultaneously with the change of name, the constitution and objects of the association had been extended. It would make every endeavour to safeguard the public against misleading advertisements, adulteration of medicines and other malpractices. The association would co-operate closely with Government departments and institutions in research and development problems. Co-operation with such bodies as the FBI and the Pharmaceutical Export Group would continue.

An aspect of the Health Service upon which the association did not see "eye-to-eye" with the Government was the question of the employment of trade emblems denoting the source of the products supplied to the public. It was felt that unless the manufacturer were enabled to characterise his products in such a way, there would be an opportunity for manufacturers without a good reputation to lose, to "cash-in" and market inferior products. Several M.P.s had been approached in this matter, and it was hoped an amendment would soon be proposed.

## German Scrap : 500,000 Tons for U.K.

**A**NSWERING questions from members of the U.S. Senate Small Business Committee regarding the disparity between Britain's imports of 500,000 tons of German steel scrap and America's receipt of 7000 tons, Under-Secretary William C. Foster said that many technical difficulties and the greater distance involved had hindered the return of a larger amount of scrap to the U.S.A.

Mr. Alex. Miller, of the scrap committee of the Department's Office of Industry Co-operation, said that much of the scrap recovered by the British was from Army sources and added that the American Army had recently accepted bids for 75,000 tons of scrap and this amount, together with

another 147,000 tons now in Italy for processing, would shortly be returned to the U.S.A.

### Aluminium Scrap for America

Meanwhile, in connection with the first sale of aluminium scrap at Heidelberg, U.S. trade sources report the purchase of 5600 tons by the Aluminium Company of America at a price of about 12 cents per lb. The metal, consisting of 90 per cent secondary aluminium from wrecked aircraft, was sold by the U.S. Army under a sealed bids system.

It is estimated that only 2000 tons of this material can be shipped to America at the present time and the remainder still awaits preparation.

## RIC EXAMINATIONS : FIFTEEN NEW FELLOWS

**T**HE Royal Institute of Chemistry has announced the names of successful candidates in the April examinations, including 15 who passed the Institute's examinations for Fellowship. Details of the Fellowship examination results are as follows:—

Branch C, Organic Chemistry; BENTLEY, Reginald Alfred.

Branch E, the Chemistry, including Microscopy, of Food and Drugs and of Water: ALLEN Douglas Geoffrey Glenn, M.A. (Cantab.); CHAPMAN, William Bernard, B.Sc. (London.); DARBISHIRE, Otto Bernhard, B.Sc. (Lond.), A.R.C.S.; HATFUL, Ronald Stanley; JONES, John Mather; JONES, Wynford Price; LEWIS, William Maurice; PARK, John, B.Sc. (Edin.); PARKS, Victor Harold; ROBINSON, Marcus, B.Sc. (Lond.); ROBINSON, Wilfred Parr; SIRIMANNE, George Arthur Colvin, B.Sc. (Lond.).

Branch G, Industrial Chemistry: (Dyes and Intermediates): PLANT, Jack, M.Sc.Tech. (Manc.). (Refractory Materials): HEDLEY, Christopher Stelling.

### Associates

The following were successful in the examination for Associateship:—

AMES, Donald Edward, B.Sc. (Lond.), The Polytechnic, Regent Street, London; AUSTIN, Denis Leonard, B.Sc. (Lond.), City Technical College, Liverpool; BARBER, George Edward, Royal Technical College, Salford; BELL, Leonard Gerald Eugene, University College, Southampton; BOWERS, Allan, Royal Technical College, Salford; BROWN, Edward Alan, College of Technology, Manchester; BURDEN, Eugene Henry William James, Sir John Cass Technical Institute, London; CASSIDY, James, Royal Technical College, Glasgow; COOK, Edwin Ralph, Merchant Venturers Technical College, Bristol; CROSSLEY, Harold Gartside, Royal Technical College, Salford; CUTHERBERT, Cyril, B.Sc. (London), Harris Institute, Preston; D'ARCY, Joseph Michael, City Technical College, Liverpool; DAWSON, William, Royal Technical College, Glasgow; DOBSON, Stanley, Technical College, Bradford; DRAKE,

Ramsay William, College of Technology, Manchester and West Ham Municipal College, London; FLINT, George Norman, Technical College, Coventry; FRITH Herbert Alan, Stockport College for Further Education and Royal Technical College, Salford; GILBY, Jack Arthur, Northern Polytechnic, London; GLOVER, Harold Gordon, College of Technology, Manchester and Royal Technical College, Salford; HART, Everard Peter, Loughborough College; HASTINGS, Dennis, College of Technology, Rugby; HAYES, James John, Sir John Cass Technical Institute and The Polytechnic, Regent Street, London; HAYNES, Harold George, Birbeck College, London; HERIAN, Miss Barbara Joan, Birbeck College and The Polytechnic, Regent Street, London; HISGON, Geoffrey William, City Technical College, Liverpool; HOLMAN, Leonard, B.Sc. (Lond.), Northern Polytechnic London; HORLOCK, Anthony Barrington, The Polytechnic, Regent Street, London; HUDSON, William, Technical College, Paisley, Royal Technical College Glasgow and Northern Polytechnic, London; KELSO, Robert William, Technical College, Lancaster; LAKING, Miss Evelyn, Technical College, Lancaster; LAMOND, John James, Denbighshire Technical College, Wrexham and Royal Technical College, Glasgow; LAVENDER, Ronald Morris, South West Essex Technical College, Walthamstow; LEMMON, Reginald Samuel, City Technical College, Liverpool; MCALPINE Andrew, Royal Technical College, Glasgow; MOSS, John Arthur, B.Sc. (Lond.), A.R.C.S., Imperial College London; PARKER, Derek Brian Valentine, B.Sc. (Lond.), University College and Northern Polytechnic, London; PICKLES, Sydney, Technical College, Bradford; ROBINSON, George Richard, City Technical College, Liverpool; RUSSELL, Keith William, B.Sc. (Lond.), University College, Southampton and Municipal Technical College Bolton; SKERRITT, Edward John, Merchant Venturers Technical College, Bristol; SOUTHERN, Charles William, B.A. (Cantab.), University of Cambridge and City Technical College, Liverpool; STOCK, Frank George, Technical College, Cardiff; STOCK, John Albert, Portsmouth Municipal College; SUDDABY, Donald, Municipal Technical College, Hull; SUTHERLAND, John Clifford, City Technical College, Liverpool; SUNTO, Gerald, The Polytechnic, Regent Street, London; THOM, Derek Walter, B.Sc. (Lond.), Northern Polytechnic, London; WEBSTER, Arnold Richard, Loughborough College; WESTMORE, Charles Derham, B.Sc. (Bris.), The University and Merchant Venturers' Technical College, Bristol, and University College, Nottingham; WOOD, Norman, B.Sc. (Lond.), Technical College, Bradford; WRIGHT, Donald Goch, College of Technology, Leeds.

# WOOD CHEMISTRY STUDIES

## Possible Sources of Sugar and Fertilisers

**A** NEW and more promising approach to the remunerative production of sugar, industrial materials and fertilisers from timber is being made with the full support of the Food and Agriculture Organisation of UNO. The London UNO Information Centre, reporting on this, states that a new process originated in Finland has formed part of a two-day study in Geneva by 14 leading European wood chemists.

These scientists are members of the Wood Chemistry Sub-Committee of the Forestry Advisory Committee of FAO. This, the first meeting of the European members, was convened by the secretariat of the Joint Timber Committee of FAO and the Economic Commission for Europe. The purpose of the meeting was to permit a pooling of information in order to accelerate advance in forestry chemistry, and to advise FAO how it could, on the international level, assist countries in their efforts to promote the development of forestry chemistry. The Wood Chemistry sub-committee's chairman is Mr. Herman F. Mark, professor of organic chemistry at the Polytechnic Institute of Brooklyn, New York.

### Study of Lignin

Discussion at the Geneva meetings ranged from fundamental research into the primary components of wood—lignin and cellulose—to the economics of industrial products. The most important research problems turn upon the use of lignin. This substance, which comprises about 28 per cent of the wood structure, has until recently been largely a waste product, discharged from the pulp mills as waste sulphite liquor. More complete knowledge of the nature of lignin must be available before science can devise new uses which will be of sufficient volume

affectively to cover conversion costs.

The wood chemistry scientists agreed that the manufacturing processes which involve high temperatures and pressures, as well as treatment with chemicals, may result in changes in the molecular structure of the original lignin component of wood. They expressed particular interest in the reports made to the meeting of the further research on lignin now being undertaken at various centres in Europe and North America.

### Sugar and Fertilisers

The experts sampled sugar produced in Finland from wood in order to taste for themselves the quality of this end-product which is now being produced on a commercial basis in that country. It was pointed out that manufacturing processes which stop at the production of raw sugar solutions for use in the manufacture of alcohol, yeast and similar products, have very limited economic possibilities. If, however, these processes are carried through to the production of crystalline sugar, the supplementary returns make favourable operation possible.

The sub-committee members also heard reports of recent experiments in the U.S.A. which present interesting possibilities of a very large scale use of lignin for the manufacture of fertilisers. In view of the world shortage of fertilisers, developments in this direction are being closely watched and encouraged by FAO.

The European members of the sub-committee found their session of considerable value, and the chairman expressed the hope that the FAO would be able to arrange for a full meeting of members, both from North America and Europe, possibly on the occasion of the Wood Chemistry Congress proposed to be held in Sweden in 1949.

## FERTILISER AND BASIC CHEMICALS FOR EGYPT

**F**URTHER details are now available of the fertiliser plant for which the Washington Export-Import Bank recently granted a \$5.6 million loan to Egyptian Fertiliser and Chemical Industries, Ltd. (THE CHEMICAL AGE, April 10).

The project, which is still in the design stage, provides for the construction of three plants in one—a synthetic ammonia unit, a pressure nitric acid plant, and a calcium nitrate plant. Hydrogen will be obtained

from still gases pumped from neighbouring oil refineries, air will furnish the nitrogen and water will be obtained from the Nile. Supplies of limestone will be transported from quarries 20 miles away. Production will be at the rate of 550 tons of calcium nitrate daily.

Design and general supervision of the project has been entrusted to the Chemical Construction Corporation, New York, and some equipment is to be purchased in Britain and Egypt.

## Society of Chemical Industry

### Chemical Engineering Group

A GRATIFYING feature of the yearly report, presented by the hon. secretary, Mr. E. LeQ. Herbert, at the 29th annual general meeting of the Chemical Engineering Group of the Society of Chemical Industry, held at the Waldorf Hotel, London, last week, was the continued increase in membership during 1947, the total at the end of the year having been raised to over 700.

The report pointed out that the full programme of meetings had been successfully completed, including joint meetings with the local sections at Bristol and Leeds. It was still a matter of regret to the group that paper restrictions, and printing and binding difficulties precluded the possibility of publishing all proceedings to date, but an issue had been made of the proceedings for 1944 and every effort was being made to deal with subsequent years.

The committee placed on record its appreciation of the work of the convenor of the publications panel and of the services of Major D. M. Wilson, hon. editor, and Mr. H. W. Thorp, hon. recorder. A special tribute was also paid to Mr. Mackie and his staff for their effective work during the year. The report and accounts were unanimously adopted.

### Election of Officers

Four nominations were received for a corresponding number of vacancies on the general committee and the following members were elected unopposed : Messrs. A. D. Berk, T. F. A. Board, P. M. Griffiths and W. Preston. The hon. officers for 1948-9 are : Chairman, Mr. Julian M. Leonard; hon. secretary, Mr. E. LeQ. Herbert; hon. treasurer, Mr. F. A. Greene; hon. editor, Major D. M. Wilson; hon. recorder, Mr. H. W. Thorp.

Mr. J. M. Leonard, who presided at the gathering, made a special appeal to members to attend the annual general meeting of the Society of Chemical Industry to be held at Edinburgh in July.

### N.Z. Commissioner's Speech

Proceedings at the luncheon were enlivened by an extremely lively speech from the principal guest, the Right Hon. W. J. Jordan, High Commissioner for New Zealand. Mr. Jordan, "asked to speak on a topic as far removed from chemical engineering as possible," entertained his hearers with an informal description of the New Zealand scene with particular reference to the social legislation affecting industrial relationship, pensions and the medical ser-

(Continued at foot of next column)

## Royal Society Honours

### Sir S. Cripps and Prof. Pauling

SIR Stafford Cripps has been elected a Fellow of the Royal Society under the Royal Society Statute which provides for the election of persons who either have rendered conspicuous service to science or whose election would be of signal benefit to the society.

Announcing this last week, the society stated also that foreign membership has been granted to :

PROF. LINUS CARL PAULING (Pasadena), Professor of Chemistry at the California Institute of Technology, distinguished for his research on valency and on structural organic and inorganic chemistry.

DR. DETLEV WULF BRONK (Philadelphia), foreign secretary of the National Academy of Sciences of the U.S.A., who is distinguished for his contributions to the development of biophysics. PROF. LUITZEL EGERTUS JAN BROUWER (Amsterdam), Professor of Mathematics in the University of Amsterdam. PROF. MAURICE J. G. C. CAULLERY (Paris), Professor in the Faculty of Biological Science, Paris University.

**Better Transport for Oils and Oilseeds.**—Supplies of soap and cosmetics may be increased as a result of the United Africa Company's new policy of using dual-purpose tankers. Their vessels are expected to bring to Bromborough Dock, next year, palm oil valued at £13 million. One of the company's ships, the 6245-ton *Matadam*, can carry from the Mersey 2300 tons of dry cargo, and bring back a mixed cargo (seeds, nuts, tin ore, etc.), and also load on other journeys 5200 tons of kerosene and petrol.

vices of that country. The link between New Zealand and the "old country" was stronger than ever, Mr. Jordan declared and the New Zealander always regarded Britain as "home."

During the course of his address, punctuated by several philosophical "asides," the High Commissioner made one or two good-natured jibes at chemical engineers, but one of the gathering's loudest laughs greeted Mr. Leonard's definition of the difference between a conference and a symposium. The former, he said, was an orderly gathering of people who met together to consider some obtuse or far-fetched matter while a symposium constituted a gathering of people which, he suggested, was liable to end as an "eggy" of a highly unacademic character.

# AN INTEGRATED CHEMICAL INDUSTRY

## Big Developments Foreseen in Scotland

**C**OMPREHENSIVE proposals of a very practical nature for the development and expansion of all the fundamental component parts of Scottish chemical industry are contained in a recent report prepared by the Scottish Council (Development and Industry) and explained in detail by Prof. W. M. Cumming, chairman of the investigating committee, at a Press conference in Edinburgh last week (THE CHEMICAL AGE, May 29).

### Research Committee

One of the first steps recommended in the report is the establishment of a chemical research committee, composed of industrial, research and academic representatives, to "formulate the problems of chemical research and development which require to be investigated to meet Scottish needs to survey the facilities available for their investigation, and to make recommendations as to how these facilities can be extended if they are not found to be sufficient."

A foreword to the report indicates that the survey of Scottish industry, on which the recommendations were based, was made in 1945-6. Subsequent events, it is noted, have already altered certain aspects of the chemical industry dealt with in the report. The main recommendations and findings of the committee remain, however, unchanged at the date of publication.

In that portion of the survey which deals with the growth of the Scottish chemical industry and the extent of existing plant and machinery, it is pointed out that a large part of the output of chemical plant manufactured in Great Britain is actually fabricated in Scotland.

### Chemical Plant from Clydeside

Much of the apparatus used in the sugar industry, for instance, is still manufactured in the Clyde area, and certain types of plant, such as the centrifugal and multiple effect evaporator, were first used in that branch of the chemical industry. The engineering experience gained in shipbuilding has also been applied to chemical plant fabrication.

Machinery designers in Scotland, continues the report, must therefore adapt this past experience to meet new developments of chemical technology.

It is obvious (says the report) that plant for isotope separation must soon be manufactured in large quantities, while the development of high vacuum technique is proceeding rapidly. High pressure plant for hydrogenation, etc., are not manufactured in Scotland, although the Scottish boiler

plants are among the largest in the world. The special tools and dies for moulding plastic articles, although not usually classed as chemical plant, will require to be made by firms experienced in the fabrication of unusual castings and in problems of heat transfer.

From a mechanical standpoint, the various chemical plant firms of Scotland are well placed for dealing with any new developments of this kind. Provided that sufficient staff were available, it is probable that this branch of the industry could double its pre-war output with ease and, at the same time, venture into the newer fields which are opening in the post-war era. With labour shortage, there is a considerable temptation to remain in profitable and well-established markets, without any new departure.

### Heavy Chemicals and Fertilisers

Dealing with heavy chemicals and fertilisers, the survey points out that the lack of convenient salt deposits may militate against extensive development of the Scottish alkali industry. The other two essential materials, coal and limestone, are present in large quantities and the possibility of cheap electric power strengthens the prospect that the bulk manufacture of carbide may become one of the country's major industries.

The report adds that the production of all types of fertiliser has greatly increased during the war years and sets out the following table giving comparative output figures of the various grades between 1932-3 and 1944-5:

	1932-3	1944-5
	tons	tons
Compound fertilisers (nitrogen, superphosphate, potash)	100,000	278,000
Superphosphate (sold as such)	60,000	77,000
Sulphate of ammonia	20,000	38,500
Basic slag	10,000	15,700
Potash fertiliser (as K <sub>2</sub> O)	6,500	3,000
Lime	40,000	100,000

In the opinion of the committee, the present rate of production may not be maintained in the coming years but the country's productive capacity should be sufficient to fulfil internal demands for most types of fertiliser and even provide a surplus for export.

The committee is hopeful that the enormous post-war demand for all types of glass will be met in part by a general expansion of Scottish industry. Potential shipping facilities and the low cost of transport from works to docks offset to a large extent the relatively high cost of some essential raw materials.

Plate and sheet glasses are not made in

Scotland, but certain constructional glasses are made in Glasgow in quantities fully sufficient to supply the needs of the home market and to allow for exports.

### Ceramics, Cement and Plastics

Prospects for the ceramics industry do not appear to indicate any large-scale expansion, especially in the domestic pottery field, although the report points out that there is plenty of scope for the manufacture of sanitary ware. The chief raw material, fireclay, is abundant in the country, but glaze materials are largely imported. In addition, China clay, Cornish stone and flint have to be procured from southern England.

A Portland blast-furnace type is thought to be possibly the only grade of cement that can be manufactured from Scottish raw materials at an economic cost and the output is largely conditioned by available supplies of granulated fresh slag, which, in turn, is dependent upon the pig-iron industry. Existing plant is being remodelled to increase production of blast-furnace cement.

The survey, dealing with paint, pigment and varnish production, emphasises the desirability of increasing Scottish output in this field, and points out that there is no inherent difficulty, either in technical skill or supply, which does not apply equally in England. The main restricting factors, apart from the necessity to import raw materials, appear to be plant and labour.

In other spheres of chemical production, the report outlines the probable increase in the activities of Scottish tar producers due to the development of plastics; the necessity to enlarge domestic production of carbon black for the rubber industry, based upon the already well-established oil shale and oil refining facilities and, finally, the potential scope for the manufacture of synthetic vitamins as an integral part of the existing fine chemical industry.

The report acknowledges that for all branches of the fine chemical industry labour is short, and untrained labour has to be employed, requiring a considerable period of careful instruction. The chemical plant required is highly specialised and must be manufactured to order; this takes many months under present conditions. Raw materials, largely imported, are in almost every case in very short supply. Taxation has borne heavily on the industry, and capital expenditure has necessarily been restricted. In fact, the fine chemical industry is suffering, like most other industries in Great Britain from supreme concentration on the war effort.

The main drawback to rapid progress in the Scottish seaweed industry is stated to

be the lack of adequate transport facilities from the remote coastal areas.

Surveying future prospects of the Scottish chemical industry as a whole, the report points out that among the specific resources indigenous to Scotland and not fully utilised are water power, forest areas and pure water. All three are available in larger amounts than anywhere else in the British Isles, and any major development in the Scottish chemical industries will almost certainly be in connection with one or other of these assets.

The first mentioned will clearly lead to the manufacture of carbide, while the other two suggest the manufacture of wood pulp, artificial fibres, and paper. No effort should be spared to develop these industries in Scotland, and particularly the first, with its long list of subsidiary interests and attachments to synthetic organic chemistry. The large deposits of peat which are also available in Scotland may find much wider application in future years.

Stressing the essential rôle of research in every sphere of chemical production, the committee views with "grave concern" the migration of 90 per cent of Scottish science graduates to fill vacancies outside her borders. On a population basis, Scotland employs only one scientist for every five employed in England. The report adds: "So long as this disparity remains, Scotland can never hope to retain the position she held in the time of the heavy industries at the beginning of the century, and she certainly cannot hope to compete with other better-equipped countries in the difficult years that lie ahead."

The committee asserts that there is no question about the need for the development of new industries in Scotland, as for example, the manufacture of plastics and industrial solvents. This emphasises the importance of the new hydro-electric schemes to the chemical manufacturer.

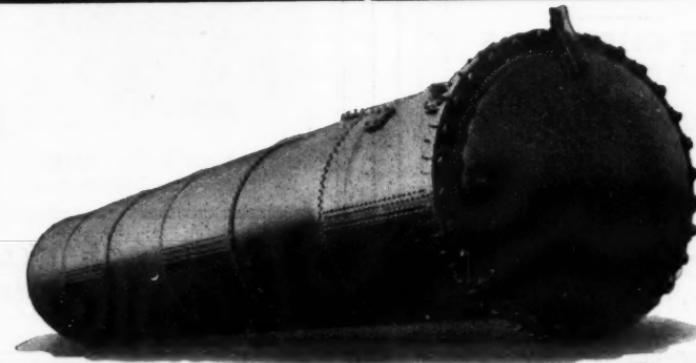
### Recommendations

Among the eleven recommendations of the committee are the examination of indigenous raw materials, such as limestone, quartz, felspar and barytes, by the proposed research body; the necessity for the Scottish chemical industries to consider the development of production under the North of Scotland hydro-electric schemes; a proposed conference between the Ministry of Labour and the manufacturers to discuss labour problems; the development of housing estates for workers in remote regions, and, in addition, the further exploration of the inherent possibilities in the Robinson-Bindley or Fischer-Tropsch processes for synthesising organic compounds.

# Metallurgical Section

Published the first Saturday in the month

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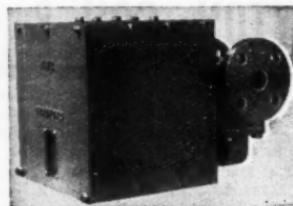
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# Metallurgical Section

5 June 1948

## METAL CLEANING PROCESSES—V

### Tanks, Sprays and Electrical Processes

by L. SANDERSON

A SIMPLE tank will be adequate for the cleaning of a small number of parts, although care must be taken to ensure that it is not overloaded. If it is overworked there is rapidly built up an accumulation of dirt, which impedes the action of the solution. The tank must in particular be deep enough to provide room and time for sediment to accumulate on the bottom, remote from the areas in which the actual work of cleaning takes place. Depth is in fact the decisive factor when agitation of the work or of the fluid is desired.

#### Draining

The floor of the tank should be slightly inclined, the lower end being farthest from the heating coil or burner. Large-sized tanks should be provided with a sump in which the sediment can be received and collected. The pipe by which the solution is drained from the tank should be placed some inches above the floor of the tank at its lowest level, especially if the sediment is thick and there is a risk that the piping may become clogged because of its small bore or complicated arrangement. By these means the solution, etc., can be drained from the tank without disturbance of the sludge. That may be eliminated separately.

Where there is little or no danger that piping will be choked, it is practicable to place the drain at the bottom of the tank, so that water pressure can be employed to eliminate both the light sediment and the solution.

#### Tank Construction

Steel tanks are generally employed, except when the solution is of a type to attack steel. The alternatives are wood, lead-lined steel, rubber-lined steel, or stainless steel.

There are various satisfactory means of heating: by steam coil of adequate heating surface immersed in the solution; by steam jet heater pumping in live steam; by gas burner in a convex chamber set off centre; by plain gas pipe burners; by gas burner with a suitable coil immersed in the solu-

tion; by electric resistance immersion heater; by strip electric heating elements placed under the tank floor; by oil burner immersed in the solution and contained in a chamber by oil combustion chamber located below the tank. The most generally satisfactory methods are the first, second, fifth and eighth.

Agitation of the solution can also be carried out in different ways, e.g., by a simple agitation shield working in combination with a steam coil; a double agitation shield with an ebullition port and steam coil; by steam jet heater; by a noiseless circulation heater; by compressed air; by a small propeller by a centrifugal circulating pump; and mechanical agitation by means of an air hoist. The decisive factor is to ensure that the solution—and subsequent rinsing water—comes into thorough contact with the work.

Some of the grease and dirt removed from the parts will collect on the surface of the solution as a scum, and this must be eliminated before the work is removed.

#### Scum Collection

To collect the scum, a permanent sheet-metal trough bent and welded along the back of the tank, and located below the solution level in the tank, can be employed; alternatively, a detachable skimming trough, given the correct form by bending, and hooked over the edge of the tank, can be used. An exterior dam that does not interfere with the work during the cleaning operation is often employed and means whereby the fouled solution may be drawn off is not difficult to devise.

Toxic, harmful or offensive vapours and fumes must be removed by an adequate ventilating system. To assist in the removal of sediment from the tank floor, a false bottom of wire mesh will collect whatever may have fallen into the tank and arrest some of the sediment too.

For some cleaning processes a method more complicated is required, such as the emulso-spray machine, comprising two  
*(Continued overleaf)*

tanks, furnished with covers, and high-pressure spray nozzles which thoroughly wet and penetrate the work with both the cleaning solution and the rinsing water. Since this kind of cleaning agent works at room temperature, it is not essential that the solution should be heated. The work is held in suspension in the washing tank by a revolving hanger hung through a ball-bearing swivel from a bracket located at the top of the tank. As soon as the spray strikes the work, the bracket revolves in such a way that each surface is wetted during both washing and rinsing. This kind of machine is employed when the production rate required exceeds that of which the plain tank is capable, but is not sufficiently great to justify the purchase of a costly washing machine.

#### Mechanical Washing

The mechanical washer consists of a spray housing or an immersion tank in which are embodied suitable means for moving and handling the work. In addition it should have means of heating, draining and spraying solutions over the work, and apparatus for drying and, on occasion, for cooling. These are the indispensable functions, together with the means of heating, agitation, cleaning and skimming.

In choosing such a machine, the type, size, number and location of nozzles, for spraying machines, must be carefully studied to ensure that the work receives the solution at the right pressure and volume, and that there are no essential surfaces left untouched. For exterior surfaces a flat spray is generally used, and round sprays are mostly confined to parts that do not possess holes, slots, or deep recesses.

The specification should cover a pump of the correct type and size. It is, on the whole, best to employ a pump of the open impeller type.

#### The Time Factor

The adequate time and rate of travel through the different machine sections must be computed with precision; mistakes may lead to the purchase of a machine totally unsuitable for the work. To prevent any clogging of the nozzles or the conveyor, it is necessary to use a fully soluble solution. On no account must alkaline cleaners embodying colloidal silicates that are insoluble be employed.

The concentration of alkaline solutions used in tanks is higher than is necessary for washing machines, about 75 to 85 per cent, in fact. Heavy cleaning work employing the correct alkaline cleaners requires an entire change of solution once a week, or sometimes every four days. Tanks and pumping lines should be thoroughly washed out when the fresh solution is introduced.

There are two main types of washing machines, those that operate continuously, and those that are intermittent. The continuous (conveyor) machines are the more common. In the continuous type, the work passes successive points where it receives a specific treatment, and because the work moves, it is possible to build the machine to accommodate the exact number of stages called for. These machines are easily constructed so as to join up with previously installed handling plant, and the work can then be automatically treated as part of a production line.

#### Non-Continuous Machines

Non-continuous machines can be divided into tunnel and cabinet types. The work does not move in either, and is sprayed or rinsed from tanks of solution suitably located. This restricts the total number of processes that can be embodied, so that these machines are generally used only for washing and rinsing, though it is feasible to widen their application to a limited degree. The non-continuous machine is usually loaded and unloaded manually, but a number of machines have, in fact, simple methods of conveying for the location and removal of the work.

The solution used in electro-cleaning tanks, which should not be overlooked, is generally alkaline and of special composition. It is necessary to pre-clean to ensure complete success. The work generally comprises one electrode in the solution, and through it passes a D.C. current. This generates hydrogen at the cathode and oxygen at the anode. The cathodic cleaning does not produce tarnishing and corrosion of the work, by reason of the hydrogen.

#### Action of Electric Current

A considerable amount of dirt is removed by the action of the electric current, and the hydrogen operates under the solid particles of foreign matter and loosens them.

It is necessary to compute with precision the distance between the work and the anodes so as to ensure uniform current distribution, particularly if the shape of the work is intricate. A potential of 6 to 8 volts, with a current density of 20 to 40 amps. per sq. ft. of surface to be cleaned is on the whole the best.

Heating of the solution is advisable so as to reduce the resistance to the current flow and accelerate the cleaning. The cathode should preferably be of a non-ferrous alloy little subject to tarnishing and corrosion. Iron and steel are both capable of being cleaned electrolytically, using either cathodic or anodic processes, if the alkaline solution is free from corroding

(Continued on page 788)

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# SUPERSONIC TESTING OF WELDS

## Effective with Steel and Non-Ferrous Metals

**W**EELDS in ferrous metals and light metals can be inspected for lack of bond and other defects by means of a newly-developed testing technique employing high



frequency sound waves generated by a supersonic reflectoscope manufactured by Sperry Products, Inc., Hoboken, New Jersey.

The new development, known as angle

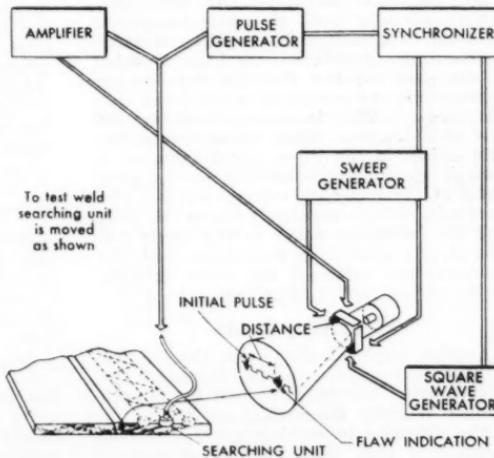
beam transmission, makes possible the entrance at an angle of the sound beam into the welded part. The searching unit, whose primary element is a quartz crystal, can be placed on the smooth parent metal adjacent to the weld, or even at some distance from it. The energy travels by successive reflections between the surfaces of the material until an interface is reached. The weld metal itself will not constitute a reflecting interface, but any voids or inclusions will reflect part of the sound beam back to the searching unit where it will be amplified to provide a vertical deflection of the horizontal trace on an oscilloscope screen.

A time-marking system allows accurate calibration to determine the distance from the searching unit to the flaw, and it is thus possible to distinguish between any defects in the plate and those in the weld area.

It is also possible with the instrument to locate smaller defects at greater depths than with X-ray or other non-destructive testing equipment and, by controlling the sensitivity of the instrument, defects or voids too small to affect the efficiency of the weld can be ignored.

Since sound waves travel equally well in aluminum and magnesium as in ferrous metals, welds in light metal plate and sheet stock can also be inspected. The depth of penetration in these metals is comparable with that in steel and defects of the same small size can be located.

**Above:** The searching unit of the reflectoscope is directed along the line of the weld and a beam of supersonic frequency is projected through the bonded material. Right: A diagrammatic representation of the whole equipment



# Welding Technology Reviewed

## Institute's Studies of Equipment and Material

THREE reports, covering important aspects of welding technology, have been prepared for the June issue of the Welding Research Supplement to the *Transactions* of the Institute of Welding. Introductory notes have been compiled by the Institute, affording some indication of the general scope of the papers.

### Voltmeter Technique

A report, prepared by Mr. A. G. Hippler, describing the working of mains-operated valve voltmeter for the measurement of secondary current in resistance welding, deals with research that shows that the well-established method of measuring voltages by the valve voltmeter technique can be successfully modified for the purpose of measuring the magnitude of currents such as are encountered in the secondary circuit of resistance welding machines.

The equipment consists essentially of an air-cored toroid and a special valve voltmeter. The toroid is of the split type so that it can be clipped around the conductor carrying the current to be measured without the operator actually having to dismantle the secondary circuit. The voltage induced in the toroid is proportional to the current flowing through the conductor, so that measurement of this voltage by the voltmeter gives an indirect indication of the magnitude of the current. Prior calibration of the instrument and toroid is therefore necessary so that current can be read direct from the meter.

An important feature of the instrument is that only one "shot" of current is required to obtain a reading. The reading is semi-permanently registered by the pointer needle, and the fact that the duration of current may be extremely short is no disadvantage. This is accomplished by the use of a low-loss series condenser in the grid circuit of the valve, which takes up a voltage closely approximating to the peak value of the incoming voltage waves. The condenser voltage negatively biases the grid, and the indicating meter in the anode circuit gives a reading in accordance with the characteristic curve of the value relating anode current and grid voltage.

### Light Alloy Welds

Another paper dealing with the testing of light alloy fusion welds, describes the work carried out by a committee of the British Welding Research Association.

The difficulty in making general recommendations that would apply to testing

welds in all types of light alloys is recognised, and it is pointed out that with the wide diversity of alloy types the same range of problems is involved as with testing welds in other metals—problems that are not fundamentally different. To illustrate the difficulties, and to assist in an understanding of the value of the practical tests applied to welds, the first section discusses certain metallurgical features of welded joints that may govern the application of tests and interpretation of results.

This is followed by a description of the type of tests, selection of test pieces and the examination by visual, metallographic and radio graphic means. The report concludes with a review of the various mechanical tests.

### Welding Machinery Construction

The third paper submits recommendations for the design of arc-welded mild steel machinery constructions and outlines the work of another committee of the British Welding Research Association.

The report points out that the formulation of general design rules for welded machinery construction presents a particularly difficult problem. A variety of components of complicated form may be involved in any one application, and the effects of boundary conditions and continuity in the structure, from the point of view of stress analysis, cannot be easily assessed.

During the past few years, however, some experience has been gained in the design and fabrication of welded machinery foundations and parts, through the stimulation provided by war-time needs. It is the object of this memorandum to present, in a concise and usable form, a detailed outline of recommended practice based on this experienced and knowledge.

---

MR. THOMAS GLOSTER-DOWNING, chairman and managing director of Oral (Great Britain), Ltd., the London export agents, is believed to have set up a civilian flying record—250,000 miles by air since June, 1946. This protracted tour, undertaken to appoint 80 regional managers or sales managers in all the principal world markets, has just ended. Mr. Gloster-Downing reports that some 33 per cent of the new representatives were anxious to handle fuller supplies of nearly all types of chemicals.

**"A NEW CAST IRON"—II****Examples of Chemical and Mechanical Properties**

by J. G. PEARCE, M.Sc., F.Inst.P., M.I.E.E., M.I.Mech.E.\*

In the various examples it is not necessary to repeat the chemical analyses for all cases, since the irons capable of treatment are broadly of the same type. Some analyses, however, are given in Table 1 (below). In order to give a suitable comparison, the first example chosen illustrates the difference between untreated iron of the kind responding to treatment, and the same iron treated with a simple cerium addition. Later examples give the form of the treatment yielding best results, the double treatment, that is, a cerium addition followed almost immediately by a ladle graphitiser such as ferro-silicon, or silico-manganese-cerium.

The figures on untreated material are naturally low, because of the high carbon and silicon contents, and do not compare with those of high-duty cast irons or even with average materials used in practice, but some comparison with high-duty irons can be gained by reference to the maximum figures given for such irons above.

In Table 2, R refers to transverse rupture stress, and T ultimate tensile stress in tons per sq. in. S refers to shock or impact strength in ft. lb. on an unnotched bar, always 0.798 in. diameter and generally machined from the 0.875 in. bar, H refers to Brinell hardness, all measured in accordance with the appropriate British Standard Specifications. Deflection in transverse is given in inches as D and elastic modulus in millions of lb. per sq. in. as E. Owing to span variations in testing the standard transverse bars, deflection figures for differing bar sizes do not permit ready comparison among themselves, but comparisons may be made on all bars of the same diameter.

Generally nodular graphite irons have a lower deflection for a given load than flake graphite irons, but the breaking load is so

much higher that the accompanying deflection figures at fracture greatly exceed those obtained on the flake graphite irons. The ratio of transverse to tensile strength is roughly comparable with that obtained for the flake graphite irons. The compression strength is two or three times the tensile strength. Shear and torsional strengths are related to tensile strength in much the same way as in the flake graphite irons.

The elongation on ordinary as-cast treated material is small, of the order of 1 per cent on a 2-in. gauge length, but when the material is annealed figures up to 3 per cent are normal and 5 to 6 per cent has been recorded.

*Example 1.*—Hematite pig-iron subjected to single treatment. Analysis A, Table 1. Mechanical properties.—Table 2.

*Example 2.*—Hematite pig-iron (Analysis B, Table 1) submitted to double treatment, and tested on 1.2 in. diameter bars.

R 70 tons per sq. in.  
D 0.60 in.  
T 36 tons per sq. in.  
H 241  
S 72 ft. lb.

The properties after double treatment are markedly superior to those after single treatment, Example 1.

*Example 3.*—L is a straight hematite pig-iron, single treated; M is a straight iron double treated, both of analyses similar to Example 2. N is a double treated similar iron, to which 2 per cent of copper was added to make a low alloyed iron in which the structure was mainly pearlitic. All results are on the 0.875 in. bar, other bar

(Continued overleaf)

TABLE I  
CHEMICAL ANALYSES

Sample	Total carbon	Silicon	Manganese	Sulphur	Phosphorous	Cerium	Nickel	Copper	Chromium
A ...	3.72	3.13	0.74	0.007	0.038	0.040	—	—	—
B ...	3.71	2.96	0.54	0.010	0.033	0.051	—	—	—
C ...	3.28	3.08	5.8	0.022	0.072	—	11.87	—	—
D ...	2.76	2.68	0.45	0.017	0.024	—	13.24	6.74	1.74
E ...	3.69	2.77	0.63	0.005	0.045	—	—	—	—

TABLE 2  
MECHANICAL PROPERTIES

Dia. of test bar, inches	R	D	T	H	S
1.6 ...	23.0	44.2	0.20	0.32	11.2
1.2 ...	28.8	45.3	0.28	0.38	14.3
0.875 ...	30.7	47.1	0.18	0.23	16.6
0.6 ...	30.8	57.4	0.11	0.22	18.6

sizes showing changes similar to those given in Example 1. The fatigue strength and endurance ratio should be noted.

*Example 4.*—An iron of 3.18 per cent total carbon and 4.69 per cent silicon was single treated. The silicon content places this iron almost in the Silsil class, but the figures are much higher than are normally obtained, in this case on a 1.2 in. bar.

R	35.6	tons per sq. in.
D	0.21	in.
T	23.2	tons per sq. in.
H	252	
S	10	ft. lb.

*Example 5.*—A single treated iron of silicon 14.5 per cent and total carbon 0.98 per cent, of the acid-resisting type, had a tensile strength of 8 to 12 tons per sq. in.

*Example 6.*—Au austenitic iron, Nomag, with single treatment and analysis C, Table 1. Mechanical properties.—Table 3.

*Example 7.*—An austenitic iron, Niresist, analysis D, Table 1, tested on 0.875 in. bars, single treatment.

	R	D	T	H
Untreated	29.2	0.47	12.2	146
Treated	47.5	0.86	20.6	185

*Example 8.*—A cupola-melted grey cast iron, desulphurised before treatment with soda ash and double treated. Analysis E, Table 1.

Bar dia., inches	R	D	T	H
3.0	... 47.5	0.51	38.0	241
2.1	... 63.8	2.14	—	—
1.6	... 68.0	1.30	—	—
1.2	... 61.5	0.95	35.9	218
0.875	... 78.0	0.83	34.1	244
0.6	... 80.0	0.53	—	—

*Example 9.*—A single treated nodular graphite iron containing 2 per cent nickel and 0.6-0.7 per cent molybdenum, heat-treated for five hours at 320°C., as is usual for acicular irons, gave the following results:

Bar dia., inches	R	D	T	H
1.2	... 89.9	0.47	42.6	412
0.6	... 125.1	0.28	51.7	477

Many problems have to be solved before this material reaches commercial production, but it is hoped that this account will assist chemical engineers in deciding whether it is likely to be of service to them. (Concluding the article, of which the first part appeared on pp 616-618, May 1.)

\* By courtesy of the British Cast Iron Assn. and the Chemical Engineering Group, Society of Chemical Industry.

## Nationalisation of Steel Expansion Continued Despite Uncertainty

**I**MENDING nationalisation, despite Government obscurity as to what section of the iron and steel industry it was its intention to include, had not prevented the company from proceeding with its extension plans, said Mr. A. G. Stewart, Stewarts & Lloyds' chairman, at its 58th ordinary general meeting.

"From the shareholders point of view," said Mr. Lloyd, "as indeed from the management point also, the position is disturbing and unsatisfactory, but I can only repeat what I said to you last year: that your company, as it stands to-day, as a result of years of careful planning and development, and, I might add, of financial prudence, is sound in wind and limb."

"Left to manage its own affairs, the development which the company was now carrying out, and had in view, would place it in an even stronger position in the future to serve the needs of consumers both at home and abroad."

## Italian Metals and Chemicals

Output of Italian pig-iron rose last year by approximately 72 per cent to 310,000 metric tons, compared with the 1946 figure; steel output at 1.6 million was 42 per cent higher, while aluminium production rose by 140 per cent to 24,400 tons. In the coal mines of Sardinia, 3.2 million tons were produced (an increase of about 20 per cent), while cement output rose by 60 per cent to some 500,000 tons. Lignite output rose by 25 per cent to 1.9 million tons, but anthracite was unchanged at 116,000 tons.

Nitrogenous fertiliser manufacture totalled 155,000 tons or 55 per cent of normal pre-war production, 685,000 tons of sulphuric acid was roughly 75 per cent of the pre-war figure, while soda output at 155,000 tons was equal to only 45 per cent of the pre-war output. Production of calcium carbide at 155,000 tons was equivalent to the pre-war rate.

TABLE 3  
MECHANICAL PROPERTIES

Dia. of bar	R	D	T	E	H	S	Bending fatigue Tons/sq.in.	Endurance ratio
1.6 inches	14.4	46.3	0.60	1.75	5.3	17.4	89.8	158
1.2 inches	16.5	47.2	0.80	2.0	5.9	16.7	90.7	156
0.875 inch	16.8	47.5	0.38	1.6	6.7	16.4	102	172
0.6 inch	18.8	41.6	0.32	0.65	7.3	16.0	102	105
							714	120
Bar	R	D	T	E	H	S	Bending fatigue Tons/sq.in.	Endurance ratio
L	64.2	0.38	25.4	19.1	204	—	15.0	0.59
M	73.4	0.44	35.2	24.0	249	120	16.0	0.46
N	73.8	0.26	38.2	22.8	290	120	18.5	0.48

# RUSSIAN STEEL-MAKING RESEARCH

## Recent Work on Air-Oxygen Mixtures

**E**XPERIMENTS on the use of oxygen in steel making were first made in Russia about 1934, when N. M. Mozgoroy used commercially pure oxygen blown through the C.I. melt, the blast being supplied through a pipe into the converter. Further tests were carried out during 1945-6 at the works of the Stalin Iron and Steel Trust, Kuznetsk, and results are reported by V. V. Kondakov, in *Bull. Acad. Sci., U.S.S.R.*, Tech. Sect., 1947, No. 10.

The oxygen blast was dispersed through nine nozzles or 12-14 mm. dia. in the bottom of the converter, but the wear on these was so excessive, especially with pure oxygen, that they only survived one smelting. This meant a serious loss of about two days in cooling the plant, renewing nozzles, and starting up again. The total working area of the nine nozzles was 13.8 cm<sup>2</sup>. Percentage oxygen concentrations used were 100, 75, and 50.

The capacity of the converter was 1.52 cu. m., holding about 1500 kg. of charge. It was lined with Dinas bricks on a layer of asbestos 20 mm. thick. Oxygen for the blowers was supplied through a 3-in. pipe, 450 m. long. There was a special high-pressure section of the oxygen tank of 2 cu. m. capacity, and when oxygen was used, pressure was raised to 80-100 atm., working pressure in the supply pipe being kept at about 10 atm. by a manual valve. Compressed air was added to the air-oxygen mixture by a manual valve in the branch pipe from the works main air supply. The pressure of blast varied from 1.0 to 1.4 atm., the first half of the process being carried out at higher pressure than the second.

### Composition of Charge

De-oxidisers used were ferro-manganese and -silicon, with aluminium. It is stated that the heat generated by the burning carbon of "chemically cold" cast iron is sufficient to raise the temperature to 1500°C., which is adequate for the whole process of conversion. The converter charge consisted of Satkin converter pig and scrap steel, proportioned so that the required silicon content, 12 per cent coke, and 3 per cent flux, was maintained in smelting. Percentage chemical composition of the charge was as shown in Table I (see overleaf).

Where necessary, additional steel scrap was added to keep the silicon content at 0.4-0.5 per cent, except when air-oxygen blast was used. The total number of tests was fifteen (eleven with pure oxygen, two with 75 per cent oxygen, and two with 50 per cent).

After weighing the charge of liquid cast iron and introducing blast into the melt, 10 kg. of ferro-manganese was added, and the melt poured from the converter into the steel carrier. The remainder of the de-oxidant was then added (5 kg. ferro-manganese, 5 kg. ferro-silicon, and 0.7-1.0 kg. aluminium). The temperature of the poured metal averaged 1480°C. The steel produced was cast into ingots of about 1350 kg., usually in one pouring. Eleven ingots were rolled into billets and then into round bars and strip. They were then subjected to the usual tests.

When using 100 per cent oxygen blast, the period of smelt was 4.5 min. with the 14 mm. nozzles, and 7-7.5 min. with the smaller nozzles (10 mm.). These periods increased as the oxygen content was reduced. Yield of steel in relation to oxygen consumption and extent of oxygen enrichment and duration as shown in Table II (see overleaf).

### Waste During Blast

It is concluded from these figures that waste of metal during the oxygen blast is not greater than in normal Bessemer practice; but this is true more of the oxygen-air mixtures than of the pure oxygen, as might be expected. It is anticipated that with the right metal scrap in the converter the percentage yield of steel would be greater.

In the normal Bessemer process some 300 cu. m. of air is required per ton of cast iron, equivalent to 63 cu. m. oxygen. In working with 100 per cent oxygen, as will be seen, these figures are much lower. Oxygen used throughout the tests was near theoretical. The small quantity of oxygen required per unit of charge may be attributed to the dispersed blast supplied at the base of converter, and to the lower oxygen requirements for chemically cold cast iron as compared with the usual Bessemer charges containing 1.5-2 per cent Si.

In order to ascertain the rate of burning of impurities in C.I., two of the smelts were designed with intervals of one minute between converted turns, samples of metal and slag being taken, and the condition of the nozzles noted. The results were graphed and it appears that the Si and Mn are completely burnt out during the first minute or two; carbon took somewhat longer. In any case, the rate of eliminating impurities was two or three times faster than usual. At the end of the blast the product had only a trace of Si and Mn, and C content varied from 0.05 to 0.20 per cent.

(Continued overleaf)

The steel ingots were rolled into billets, bars and strip, and thoroughly tested as to physico-chemical properties and micro- and macro-structure. The following conclusions are drawn:—

(1) The steel produced with oxygen or oxygen-enriched air had generally better mechanical properties than the corresponding grade of ordinary Bessemer or Martens steel.

(2) By addition of alloying elements after the converter had been turned it was hoped to produce electro quality steel, though further work in this direction would be needed.

(3) Samples taken along the whole length of the rolled steel showed very even composition.

(4) Macro- and micro-structure was also very satisfactory, showing normal dispositions and complete absence of blow-holes, cracks, or other defects. Regions of pearlite resembling sorbite were evenly distributed in the ferritic matrix along the grain boundaries, and inclusions—mostly oxides

with a little sulphide—were relatively slight. Nitrogen content was practically nil (0.0010 to 0.0059).

With regard to wear, the Dinas bricks sometimes fused and were replaced by chrome-magnesite bricks jointed with chromite paste. Further study is urged in two directions:—

(a) On nozzles made from one or two refractories baked at high temperature; and (b) on methods of introducing oxygen into the melt that would ensure longer life of nozzles, and on tests of varying arrangements of nozzles, their position in the converter, and their area.

Further matters requiring study are automatic control and determination of optimum end-point of operation in relation to the kind of steel required; and the addition of alloying elements for production of electro or other steels. Meantime it is concluded generally that the Bessemer process with oxygen blast is the most economical method of producing high grade steel.

TABLE I.

	Si	Mn	C	S	P	Cr	N.	A.
Satkin cast iron	0.70	0.76	4.22	0.02	0.04	0.26	0.25	of
do.	1.4	1.78	4.08	0.03	0.05	0.27	0.19	year
Steel scrap	0.21	0.69	0.58	0.03	0.01	—	0.06	City

TABLE II.

No. of smelt	Duration (min.)	Charge (kg.)	Yield per cent	Oxygen per cent	Total O <sub>2</sub> per ton (cu.m.)	Total O <sub>2</sub> + air (cu.m.)
3	5' 94"	1025	80.2	100	36.5	—
5	4' 50"	1800	75.0	100	39.6	—
6	4' 24"	1600	87.2	100	33.4	—
12	11' 06"	1720	90.8	75	45.2	52.3
13	13' 09"	1700	90.0	50	36.5	45.2

## POTENTIALITIES OF U.S. DOLOMITE DEPOSITS

THE possibilities of commercially processing vast deposits of dolomite limestone in western Ohio to produce lime and magnesium and the use of the latter in such a way as to permit increased steel production in America's open-hearth furnaces were discussed in a technical paper submitted recently to the American Institute of Chemical Engineers by Mr. C. C. Brumbaugh, of the Diamond Alkali Company.

### By-product Magnesium

After pointing out that magnesium emerges as a by-product during the extraction of lime from dolomite, instead of common limestone, Mr. Brumbaugh said that the large shaft kilns in which the dolomite is burned are lined with bricks made from a form of magnesium that withstands

the greatly increased temperatures brought about by the new method of injecting oxygen into steel making furnaces to increase capacity.

Discussing the operation and performance of these kilns, 80 ft. high and 24 ft. in diameter, burning approximately 400 tons of crushed dolomite every 24 hours at the Diamond Company's Painesville plant, Mr. Brumbaugh said that both the equipment and operating methods differed considerably from those used in the treatment of common limestone and added that if producers of alkali chemicals were to use dolomite instead of common limestone the potential volume of magnesium made available would amount to about 800,000 tons.

The estimated 1947 consumption of common limestone by alkali manufacturers was just under 6.5 million tons.

## American Chemical Notebook

From Our New York Correspondent

DURING discussions before a U.S. Senate Armed Services sub-committee, which is considering a proposal to continue U.S. Government operation of the Reconstruction Finance Corporation, Texas City, tin smelter beyond June 30, 1949, when authority to operate the smelter expires, Mr. J. Croston, a metals expert of the National Securities Resources Board, accused Great Britain of using an export tax on Malayan tin ore to "hamstring" U.S. operation of the smelter. So prohibitive is the export tax, Mr. Croston told a reporter, that it bars the U.S.A. from obtaining the high-grade Malayan ore. He alleged that Britain will not remove the tax unless the U.S.A. stops subsidising Texas City production. He forecast that the situation would result in abandonment of the American smelting operation—"what they would like to see happen."

\* \* \*

Asking the court to dismiss the charges of negligence in connection with last year's ammonium nitrate explosion at Texas City, the U.S. Government, which is contesting damage claims amounting to \$198 million, contends that the blame for the disaster rests with the steamship companies which operated the two ships *Grand Camp* and *High Flyer*, the longshoremen's unions, stevedoring firms and the public authorities of Texas City. Government attorneys have also prepared a defence against the \$8 million damage claim by the Texas City terminal railway company.

\* \* \*

The U.S. Office of International Trade has announced that export "applications for reasonable quantities of natural soda ash will be approved without restriction." While exports will continue to require a validated licence, limited domestic demand has resulted in an actual surplus of production capacity. This situation exists despite an overall shortage of soda ash. All applications for soda ash must still be accompanied by evidence of an accepted order from a foreign buyer, showing the price at which the sale was effected.

\* \* \*

University of Pittsburgh chemists believe that their new \$25,000 apparatus for the production of liquid helium, designed by Prof. S. C. Collins, of the Massachusetts Institute of Technology, will lead to lowering of the cost of the steel production. The machine, the Collins helium cryostat, permits experiments to be carried on in a cold

chamber at temperatures down to  $-455.8^{\circ}\text{F}$ . Dr. W. E. Wallace, assistant research professor of chemistry at the University of Pittsburgh, says the use of larger units of the machine would result in the production of liquid oxygen for use in smelting operations.

\* \* \*

U.S. production of eight industrially important inorganic chemicals—synthetic ammonia, ammonium nitrate, chlorine, hydrogen, phosphoric acid, soda ash, caustic soda, and sodium silicate—in March was the highest on record, according to statistics compiled by the Commerce Department's Bureau of the Census. Near record productions were reported for chrome green, nitric acid and sulphuric acid. The March production of normal superphosphate fertiliser material totalled 930,154 and 1,838,196 short tons respectively. Production exceeded the previous high record reported for December, 1947, by 59,136 short tons and was 17 per cent larger than that reported for March, 1947.

\* \* \*

The Dow Chemical Company has just announced a new pricing system—applicable to all new orders received for magnesium extrusions—which is expected to result in an average price reduction of approximately 10 per cent and bring many extruded shapes in direct competition with aluminium. The new system departs from the traditional form factor method to relate prices of various extruded sections more closely to actual production costs. While reductions of as much as 15 per cent will apply to some heavier sections in the more commonly used alloys, less advantage will be apparent in the lighter and more complex shapes.

\* \* \*

Arrangements have just been concluded with the Chilean Government by the Chile Exploration Company, a subsidiary of the Anaconda Copper Mining Company, providing for the expenditure over a period of years of \$130 million for the development of new plants and other facilities at the company's copper deposits in Chile. The agreement provides for an initial expenditure of \$60 million over a four-year period, and will be spent to treat increasing amounts of copper-bearing sulphide ores. At present the company is treating only oxidised ores. Present output of the subsidiary is running at the rate of 450 million lb. annually and it is expected that the new plants will enable the company to maintain a production level of at least 540 million lb.

## U.S. Exploits Taconite

### Substitute Iron Ore

**T**ACONITE, a plentiful iron-bearing rock which has hitherto been ignored in favour of the richer ore bodies in the Lake Superior region, will provide a fresh natural resource by development of new ore concentration methods in the new research laboratory and pilot plant of Oliver Iron-Mining Co., U.S.—a subsidiary of United States Steel in Duluth, Minnesota. This has become necessary because the top-grade ore deposits of the Lake Superior region will last for only 20 years at the current rate of consumption.

A review of past mining activity shows that more than 2.25 billion gross tons of iron ore have been shipped from Lake Superior mines since ore was first discovered there almost 100 years ago. Of this amount, 1619 million tons came from Minnesota's three ranges, almost 72 per cent of the total for the entire Lake Superior district. About 30 million tons of highest grade ores left the Minnesota ranges last year.

In the future the supply of ores will be gradually augmented by a steadily increasing amount of concentrates and specially treated low-grade ores. Mr. W. L. Maxson, Oliver's vice-president in charge of research, has stated: "Since there are billions of tons of taconite the perfection of an economic method of extracting iron from it should solve the problem of U.S. iron ore reserves for years to come. Future ores," he predicted, "would be more uniform in grade, both chemically and structurally, than Nature provided."

### METAL CLEANING PROCESSES

(Continued from page 780)

salts. Brass and copper are similarly being cleaned in this way and although slight tarnishing is caused, this is rapidly eliminated if the work is given a short dip in dilute acid. The small amount of etching caused by anodic cleaning produces a better bonded plate.

Some parts are being made the cathode for from one to two minutes, made the anode for an identical period, and afterwards made the cathode again for the same duration. If the anodic process is used, from 50 to 100 amp. per sq. ft. current density should be used.

In this method the alkaline cleaning agent should wet adequately, and in consequence the foreign matter will be more speedily removed and current will be saved. The cleaner should withstand acid and hard water, and should not form harmful scums

## £50 More for Tin

### Second Increase Since March

**A**SECOND very substantial rise within approximately eight weeks in the officially regulated price of tin metal is announced by the Ministry of Supply. Its effect is to add a further £50 per ton to prevailing rates for all grades of tin, as from Tuesday this week.

The Ministry's statement records that the buying price for Malayan metal has been increased from £504 to £554 per ton *ex* smelters' works (Penang or Singapore) and the buying price for Nigerian tin concentrates is increased from £485 10s. to £535 10s. per ton of tin in ore f.a.s. Nigerian port. The selling price of Malayan metal is raised from £505 10s. to £555 10s. per ton *ex* smelter (Penang and Singapore).

The Ministry also announces that from June 1 the U.K. selling price of tin metal of minimum 99 per cent up to under 99.75 per cent tin content, will be increased from £519 to £569 per ton (f.o.b. U.K. port or delivered U.K. consumers' works). Other grades are correspondingly varied as follows: Refined tin 99.75 per cent minimum from £522 10s. to £572 10s.; refined tin 99.9 per cent minimum, 28 lb. ingots from £527 to £577; grain bar tin from £539 to £589; granulated tin from £544 to £594.

**Power Cartridge Exhibition.**—To demonstrate to engineers the potential industrial applications of the power cartridge, I.C.I., Ltd., has opened a permanent exhibition at the Engineering Centre, Ltd., Glasgow.

as a result of drag-over. In addition it must be extremely free rinsing, to prevent it from harming the following solutions, and finally, it must be capable of taking the high current density required.

(End)

## "LION BRAND" METALS AND ALLOYS

MINERALS AND ORES

RUTILE, ILMENITE, ZIRCON,  
MONAZITE, MANGANESE, Etc

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## Home News Items

**Steel Assets Segregated.**—Thos. Firth and John Brown, Ltd., announces that it has recently segregated from its general assets those which are specifically employed in the production of iron and steel.

**New Antiseptic Factory.**—A new factory was opened on Tuesday by the Lambert Pharmacal Company at Victoria Road, South Ruislip, Middlesex, for the production of Listerine antiseptic and other products.

**1948 Coal Exports.**—The global tonnage of coal covered by trade agreements for 1948, said Mr. Robens in reply to a Parliamentary question on Tuesday, amounted to over 9 million tons. Another 7 million tons were being provided for bunkers and bunker depots abroad.

**£1 Million Whale Oil for Britain.**—Carrying 14,000 tons of oil and 2000 tons of dried whale products valued at £1,260,000, two whale oil tankers, the *Polar Chief* and the *Saluta* arrived in the Mersey last week from the Antarctic. The vessels unloaded the by-products at Liverpool and oil at Manchester.

**I.C.I. Boring for Potassium.**—Contractors employed by Imperial Chemical Industries are boring at Lowdale, Sleights, in an attempt to find potassium brine. Geologists believe the area may yield sufficient to warrant commercial production. Should the borings prove successful the potassium brine will be conveyed 20 miles by pipeline to the new I.C.I. works at Wilton.

**Insufficient Cement.**—Cement shortage is so acute on Merseyside that unless it is remedied quickly there is a likelihood of more unemployment in the building industry. Mr. H. Langford, director of the Liverpool Federation of Building Trades Employers, said last week: "We were told last year that the cement shortage was because of the fuel crisis; this year we are exporting about 50 per cent. more cement than we were in 1938—approximately 100,000 tons a month."

**Paper Production in the U.K.**—Despite the fact that the output in January and February this year was above the average for 1947, the production of paper in the U.K. during these months fell short of the level reached during the latter part of last year, states the *Board of Trade Journal*. Most types of paper shared in the improvement over the 1947 average, but newsprint output in January this year (weekly average 3949 tons for a five week period) was at the lowest level since the 1947 fuel crisis. Cigarette tissue production fluctuated at about pre-war level and packing papers averaged about 95 per cent of pre-war production.

**Tin Allocations.**—The Ministry of Supply announces the following further allocations of tin metal made by the Combined Tin Committee for the first half of 1948: Greece 75 long tons, and Turkey 200 long tons.

**Iron and Steel Achievement.**—Production during the last 12 months at the Excelsior Iron and Steel Works, of John Williams and Co., Ltd., Wishaw, Lanarkshire, has increased by 10 per cent despite difficulties in obtaining raw materials.

**Coal Output Better.**—Total coal production last week amounted to 4,237,500 tons, comprising 3,957,700 tons from deep-mined sources, and 279,800 from open-cast mines. These results, the best since April 24, were more than a million tons higher than at the same period last year. Output for the year to May 29 was 85,069,000 tons.

**B.A.C. Manchester Office.**—The British Aluminium Company's Manchester branch office (North Western Area) has been removed from Chancery Chambers, 55 Brown Street, Manchester 2, to 46 Fountain Street, Manchester 2. The telephone number remains the same: Deansgate 3639. Telegrams: Bratalumin, Manchester.

**Families' Service Records.**—Sixteen steel workers, each of whom has worked for more than 30 years at the Crabtree forge of Eva Brothers, Openshaw, Manchester, last week attended a special dinner in their honour and were presented with gold watches by the firm. One man has been at the forge for 50 years, his brother for 47 years and two other brothers have worked there 40 years and 35 years respectively.

**Supply Ministry in N. Wales.**—Indicative of the rapid growth of industry in North Wales is the establishment by the Ministry of Supply of a North Wales Regional Office at St. David's Road, Caernarvon. This office will handle all matters for which the Ministry is responsible, including the allocation of materials, sponsoring of applications for building licences, and providing assistance in production problems.

**Glasgow Chemical Fire.**—An outbreak of fire occurred on May 28 in the three-storey works of the British Products Sanmex Co., Ltd., Glasgow, manufacturers of chemicals, disinfectants, and soap. The fire began when a cauldron of disinfectant fluid ignited; it spread rapidly throughout the building. The employees, including 25 girl workers, got clear of the building in safety. Five firemen were injured. The building was destroyed.

## PERSONAL

**SIR EDWARD APPLETON**, DSIR secretary, is one of six new members appointed by the Pope to the Pontifical Academy of Science.

**DR. J. M. MCNEILL** and **MR. E. MENSORTH** have been elected directors of John Brown & Co., and the former also deputy managing director at Clydenebank.

**SIR ALEXANDER FLEMING** performed the inauguration ceremony at the Barcelona Hospital for Infectious Diseases last week and delivered three lectures.

**MR. ALAN R. CLARK** has been appointed sales manager of rubber chemicals for Naugatuck Chemicals division of the Dominion Rubber Co., Ltd., Elmira, Ontario.

**MR. OSWALD GRANGE MCSELEY**, of Lymn, and Budleigh Salterton, Devon, a governing director of David Moseley & Sons, Ltd., the Manchester indiarubber manufacturers, left £278,262 (net £277,090).

The Council of the Institute of Welding has awarded the prize in the competition for the design of a work-piece to **MR. R. A. IDDON**, senior planning engineer in the medium plate shops of C. A. Harvey (London), Ltd., for a design of a welded box, to be tested to destruction under hydraulic pressure.

**MISS GRACE ANDERSON**, chief chemist for Wolsey of Canada, at St. Malo, Quebec, is the only person in the plant entrusted with the formula for the secret Wolsey process for making socks "unshrinkable." She is responsible for full dyeing processes and it is her job to see that colours are fast after repeated washings. Miss Anderson is a graduate of Leicester College of Technology, and was formerly in charge of the dye works in one of the large Wolsey Guilds of London Institute, the world's leading examining authority on textile processing.

### £100,000 for Air Commodore Whittle

The Treasury and the Ministry of Supply have received from the Secretary of the Royal Commission on Awards to Inventors their recommendation that a total award of £100,000, free of tax, should be made to **AIR COMMODORE F. WHITTLE**, C.B., C.B.E., in respect of his achievements before and during the war devising and developing practical means of applying the principle of jet propulsion and for his improvements in the designs of gas turbines and air compressors. The Treasury and the Ministry of Supply have accepted the recommendation of the Commission.

**MR. H. W. P. MATHEY**, chairman of Johnson, Matthey & Co., Ltd., has received from members of the works staff a model of his yacht, and a morocco leather bound album. The presentation commemorated his completion of 50 years' service on the board.

**DR. W. J. WORBOYS** has been appointed an additional director of Imperial Chemical Industries, Ltd., with effect from May 27, 1948. He will take charge of the paints, plastics and leathercloth group. Dr. Worboys, hitherto chairman of the plastics division, has been succeeded in that appointment by **MR. P. C. ALLEN**, a joint managing director of the division.

The Staveley Coal & Iron Co., Ltd., has acquired the whole of the shares in the Birmingham Chemical Co., Ltd., Wiltell Works, Lichfield. The business will continue to be conducted under the direction of **MR. H. D. PODMORE** and **MR. H. BENNION** as joint managing directors. The other directors are **MR. T. A. MCKENNA** (chairman), **DR. J. E. HURST**, and **MESSRS. A. E. PEAK** and **S. N. TURNER**.

At the annual general meeting of the Association of British Insecticide Manufacturers, held on May 19, the following officers were appointed: **MR. H. J. JONES**, chairman; **DR. J. R. BOOER**, vice-chairman; and **MR. R. V. CRAVEN**, hon. treasurer. The executive committee comprises: **DR. E. HOLMES**, **MR. J. S. MITCHELL**, **MR. N. K. SMITH**, **MR. F. W. SUGDEN** and **MR. H. D. H. WOMACK**.

Leeds & Northrup Co., the U.S. manufacturers of industrial measuring instruments and other equipment, are losing the services of two long-service engineers, whose retirement has just been announced. They are: **MR. PAUL G. ROTH**, shop engineer since 1919, who has been with the company for 46 years. He has been concerned mainly with simplifying manufacturing methods and designs; and **MR. FELIX WUNSCH**, an engineer and an inventor of numerous circuits widely used in electrical measuring apparatus.

### OBITUARY

**MR. HENRY LITHGOW**, a director of Colvilles, Ltd., Wm. Beardmore & Co., Ltd., and other companies, died last week.

**MR. JOHN R. DONALD**, a native of Glasgow, office manager of the Shawinigan Chemicals, Ltd., with which he had been connected for 35 years, has died in Montreal.

## Aluminium Pioneer

### Appreciation of Sir W. M. Morrison

SIR W. Murray Morrison, whose death was announced in THE CHEMICAL AGE last week, was more than a pioneer of the aluminium industry in Great Britain—he was a man to whom the industry throughout the world owes a great debt. "It was largely owing to his optimism, ability and clear judgment," says the British Aluminium Co.,



The late Sir Wm. M. Morrison

Ltd., "that aluminium, in his time, ceased to be a rarity and became one of the world's leading metals."

Born at Birchwood, Inverness-shire, on October 7, 1873, Murray Morrison trained as an engineer at Edinburgh University and at the Glasgow Technical College, where he studied under Lord Kelvin. In 1895 he went to Foyers, where the newly formed British Aluminium Co. was installing the first large hydro-electric plant in Great Britain.

### Work with Lord Kelvin

Foyers had been set up to work the new Hall-Héroult process for making aluminium by the electrolysis of alumina dissolved in molten cryolite. Murray Morrison, assisted by Lord Kelvin, had to develop and improve it in every way possible. The success of their work led to the annual output of metal from the company's Highland factories increasing from 200 or 300 tons at Foyers to a present-day total of 30,000 tons.

Murray Morrison, who was appointed general manager in 1910, managing director in 1927, and vice-chairman in 1934, was responsible for the construction of new alumina factories at Burntisland in Fife (1918) and at Newport, Mon. (1938). He was respon-

(Continued at foot of next column)

## Tribute to Leadership

### Institute of Metals Presentation

THE president and council of the Institute of Metals gave a dinner party at the Savoy Hotel, London, last week, in honour of Mr. Robert C. Stanley, chairman and president of the International Nickel Company of Canada, Ltd., and Dr. Paul D. Merica, vice-president of the International Nickel Company. Sir Arthur Smout, president, was in the chair.

During the evening Sir Arthur Smout presented to Mr. Stanley the Institute of Metals (Platinum) Medal for 1948, awarded to him in recognition of his outstanding services to the non-ferrous metal industries.

### Contemporary Recognition

In making the presentation, Sir Arthur said that the emergence of the International Nickel Company of Canada, Ltd., as one of the world's greatest mining and metallurgical enterprises was largely due to Mr. Stanley's leadership.

All too often, concluded the president, appreciation of the merits of outstanding contributors to industrial research was not given until they were dead. The Institute was fortunate to have the opportunity of honouring such men and women during their lifetime.

sible, too, for developing the rolling mills at Milton in Staffordshire (first set up in 1894) and at Warrington in Lancashire (1912) and for the great plant established at Falkirk during the last war. With the chain of factories, comprising Burntisland, the Highland Reduction Units and the Falkirk Mills, Sir Murray, as he became in 1942, was able to claim that he had indeed created a whole Scottish aluminium industry. The ramifications of that enterprise spread throughout half the world.

With this growth of the industry, Sir Murray became well-known internationally and acquired a very considerable reputation for his great knowledge, clarity of judgment, foresight, and skill in negotiation. He was a member of the Institution of Civil Engineers, a member (and past member of Council) of the Institution of Electrical Engineers, a Fellow of the Institute of Physics, a past member of council and vice-president of the Faraday Society and of the Institute of Metals (whose Fellowship and Platinum Medal were awarded to him in 1942), and a vice-chairman of the British Non-Ferrous Metals Research Association.

His charming personality endeared him to his friends—who were many.

## Technical Publications

**P**ROGRESS in the development of industrial equipment creates an increasing number of problems in the forming and fabricating of intricate parts, of which more and more are being made from stainless steel. A new book entitled "Forming of Austenite Chromium-Nickel Stainless Steels," published by the International Nickel Co., Inc., 67 Wall Street, New York 5, N.Y., describes modern forming procedures as applied to chromium-nickel steels, and as practised in the U.S. fabrication plants. Specific examples of forming technique are supplemented by details of tool designs and tool materials, lubricants, data on dimensions, and consecutive steps in fabrication.

\* \* \*

Useful data relating to available supplies of steel liquid storage vessels of a wide variety of uses and capacities are furnished in the latest illustrated publication by Dowson & Mason Gas Plant Co., Ltd., of Manchester. The company's present range includes large and small scale rubber lined tanks, with and without agitators, of a kind applicable to many chemical and associated activities.

\* \* \*

Simplified welding techniques for maintenance and repair of a wide variety of metals, forms, castings, shapes, and heavy machinery components are set forth in a new 4-page bulletin issued by Eutectic Welding Alloys Corporation, New York. Specialised methods, which involve welds made below base metal heat of fusion through surface alloying are described, and photographs and diagrams illustrate typical step-by-step operation, when welding most typical materials, including malleable and cast-iron parts. Copies may be obtained upon application.

\* \* \*

A new booklet describing approximately 100 chemicals and classifying all the company's products by "family groups," has just been made available by the U.S. Hercules Powder Company, Wilmington, Delaware. Included among the products listed for the first time are abitol, hydro-abietyl alcohol; toxaphene, chlorinated camphene, agricultural insecticide poison; dried whey; cellulols, a series of resins especially designed for lacquers; dresinols, a series of resin emulsions containing 40 to 45 per cent solids; and other new resins from rosin. The classifications are cellulose, synthetic resins, rosin, terpene solvents and chemicals, chlorinated products,

dairy products, and explosives and sporting powders. The chemical make-up, uses and potential applications of all are briefly described.

\* \* \*

Croda, Ltd., of Snaith, Goole, are distributing in the form of a folder 32 cosmetic formulations "as basic examples for initiation of experimental work," based upon their self-emulsifying stearyl alcohol.

\* \* \*

One of the most widely used basic principles in the chemical, food and allied industries is that of evaporation. The older processes subjected the liquid to prolonged boiling which can have an adverse effect upon the quality of the finished product, even if recourse is had to vacuum distillation. This is a limitation that may well have caused the neglect of many useful procedures, particularly where highly sensitive liquors are concerned. New light on this subject is afforded by "Patent Film Evaporators for Sensitive Liquors," a descriptive booklet by Kestner Evaporator & Engineering Co., Ltd., 5 Grosvenor Gardens, S.W.1. This affords much useful information on the company's equipment which enlarges the possibility of applying evaporation processes where hitherto they have been considered unsuitable or too difficult.

\* \* \*

New low-temperature welding products, including a nickel-core cast iron electrode, a magnesium brazing alloy, and a new dispenser for silver-brazing alloy are described in the newly issued 1948 catalogue of All-State Welding Alloys Company, 96 West Post Road, White Plains, N.Y. Other new information in the catalogue includes fuller instructions for the use of low-temperature welding processes, and familiar products described include rods, especially designed for work on cast iron, steel, stainless steel, copper, copper-nickel, nickel, bronze, and other copper-bearing alloys, zinc-base die castings, aluminium, and magnesium, a galvanising powder for cast iron, a powder brazing compound, and fluxes.

\* \* \*

"Notes to Consumers," a booklet covering various aspects of the Iron and Steel Distribution Scheme, including the names and addresses of authorising departments with details of their authorising responsibilities and the items that are covered by direct authorisations, has been placed on sale this week by HMSO.

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# Overseas News Items

**Indian Sesamum Crop.**—The Indian Ministry of Agriculture estimates the sesamum acreage for the 1947-48 season at 2,072 million acres, against 2.02 million last season.

**Finland's Dollar Debt.**—Finland last week maintained her record of being the only country never to default on dollar debts contracted after the first world war by paying the U.S.A. another \$163,172 (£40,793).

**Indonesia Oil Report.**—Reports from Java say that the U.S.A., acting through the Dutch delegation with the Javanese Republican authorities, has sought authority to exploit oil resources in Indonesia.

**Reward to Soviet Atom Scientists.**—A Moscow report states that a "Stalin" prize of the equivalent of £10,000 has been awarded to two Soviet scientists who claim to have discovered fundamental information relating to atomic integration.

**Franco-Portuguese Agreement.**—Portugal is to receive 200,000 tons of French phosphates, metal products and chemicals under a one-year trade agreement just concluded in Paris. Portugal will supply 400,000 tons of pyrites and some food products.

**Escaping Oil Closes Well.**—To minimise fire risk the Alberta Government has ordered all 60 wells in the Leduc (Edmonton) oilfield to close in order that emergency crews can control a gusher well which is spraying black oil over a radius of two miles at a rate of approximately 10,000 barrels a day. Officials estimate total potential losses at more than £1,250,000.

**Mexican Firm Seeks Chemical Equipment.**—The construction of a large ammonium-sulphate and sulphuric-acid plant near Mexico City will necessitate the purchase of material, machinery and equipment to the value of approximately £1,500,000. Prospective suppliers of electrical and process equipment for this installation are invited to obtain further information from Carlos Benites, general manager, Guanos y Fertilizantes, S.A.V. Carranza 25, Mexico, D.F.

**U.S. Chemical Export Quotas.**—The Office of International Trade, U.S. Department of Commerce, has left export quotas for soda ash, caustic soda and nitrogen chemicals for the second quarter of the current year at the level for the previous three months, i.e., 60,000 short tons, 72,000 short tons and 2,500,000 lb. respectively. The growing shortage of coal tar products has necessitated a cut in the benzol quota from 1.5 million gal. to 1 million gal. and the quota for phenol has been reduced by 1 million lb. to 6 million lb.

**Meteorological Experiments.**—The Swiss Agricultural Department plans to experiment in blasting clouds with rockets and shells to prevent hailstorms.

**Ban on Lead Exports.**—Canada has declared lead and lead alloys to be "strategic metals" and has placed a ban on the export of these materials except under a special licence.

**New Chemical Works for Mexico.**—A plant for the manufacture of ammonium sulphate and sulphuric acid is to be erected near Mexico City. Equipment is to be obtained in the U.S.A.

**German Lead Mines Re-opened.**—After being idle for three years Germany's oldest lead mines, the Mechernich Works at Eifel, resumed operations recently. By the end of the year an annual output of 7000 tons is expected to be reached.

**First Groundnuts.**—The harvesting of the first yield of the groundnut scheme was witnessed last week near Kongwa, East Africa, by an official party including Mr. John Strachey (Minister of Food). No report of the probable total yield is yet available.

**Austrian Chemical Congress.**—The Society of Austrian chemists celebrated its 50th anniversary in Vienna from May 27-29 under the patronage of the Austrian Government and the presidency of Decan Prof. Dr. August Chwala. The programme included more than 20 lectures by international scientists on various aspects of pure and applied chemistry.

**U.S. Sulphur.**—Output of mined sulphur during the first quarter of 1948 was 22 per cent greater than in the first quarter of 1947, according to the Bureau of Mines, U.S. Department of the Interior. Mine shipments increased 2 per cent and apparent sales 7 per cent. At the end of the quarter stocks were 7 per cent lower than on March 31, 1947. Production during March (402,832 tons) exceeded the February output (388,332 tons) by 4 per cent.

**U.S. Buys Polish Coal for Austria.**—The first transaction in eastern Europe, under the auspices of the U.S. Economic Co-operation Administration, provides for the shipment of 20,662 long tons of coal from Poland to Austria at a cost of \$405,000. In connection with this purchase, which will be made through the Austrian Government, Mr. Paul G. Hoffman, Administration chief, said that the decision was influenced by the need to conserve U.S. supplies for domestic consumption.

## Commercial Intelligence

The following are taken from printed reports, but we cannot be responsible for errors that may occur.

### Mortgages and Charges

(Note.—The Companies Consolidation Act of 1908 provides that every Mortgage or Charge, as described herein, shall be registered within 21 days after its creation, otherwise it shall be void against the liquidator and any creditor. The Act also provides that every company shall, in making its Annual Summary, specify the total amount of debt due from the company in respect of all Mortgages or Charges. The following Mortgages and Charges have been so registered. In each case the total debt, as specified in the last available Annual Summary, is also given—marked with an \*—followed by the date of the Summary, but such total may have been reduced.)

SUNDERLAND SHEET METAL WORKS, LTD. (M.5/6/48). April 21, deb. to Barclays Bank Ltd., securing all moneys due or to become due to the Bank; general charge. \*—. December 30, 1946.

SCRIVENS, LTD. Birmingham, manufacturing chemists (M.5/6/48). April 30, mortgage to Scottish Amicable Building Society securing £1615 and any other moneys etc., charged on 122 Cherington Road, Selly Oak, Birmingham. \*Nil. February 5, 1948.

ULU YAM RUBBER CO., LTD. London E.C. (M.5/6/48). April 29, mortgage securing to Industrial Rehabilitation Finance Board, Kuala Lumpur, Selangor, Malaya, all sums which the mortgagee may be called upon to pay under or by reason of a guarantee; charged on certain lands. \*Nil. December 16, 1947.

### Satisfactions

A. KERSHAW & SONS, LTD. London, W. optical, scientific engineers, etc. (MS.5/6/48). Satisfaction April 23, of mortgage and charge reg. July 11, 1946.

MIDLAND METALS (WOLVERHAMPTON), LTD. Birmingham. (MS.5/6/48). Satisfaction April 26 of debt registered June 4, 1923.

## Company News

**W. J. Bush & Co., Ltd.**, has approved a final dividend of 8 per cent on the ordinary shares, making 12 per cent for the year.

**Cerebos, Ltd.**, announces a group trading profit (before charging taxation, etc.) of £771,333 compared with £715,778 for the previous year. A final dividend of 30 per cent, less tax, has been recommended, making 40 for the year.

**F. H. Lloyd & Co.,** steel founders, announces a sharp increase of net profit for the year to March 31—£230,307. This compares with £62,121, for the previous year. A final ordinary dividend of 7 per cent, making 10 per cent less tax for the year (same) is recommended.

Resulting largely from the increase of nearly 50 per cent in the value of petroleum products, a record increase in profits, from £9,624,938 to £18,564,857 in 1947 has been recorded by the **Anglo Iranian Oil Company**. Final dividend is unchanged, making for the year 30 per cent (same).

**Imperial Chemical Industries, Ltd.**, has announced that it has applied to the Capital Issues Committee for permission to issue one new ordinary share of £1 for each existing £5 of ordinary stock held. Existing issued ordinary capital is £50,465,116, so that the new issue will have a nominal total of at least £10,093,025. It is assumed that the issue will produce between £20-25 million of new capital.

## New Companies Registered

**G. Goulding (Chemists), Ltd.** (454,506).—Private company. Capital £5000. Manufacturing pharmaceutical and general chemists, etc. Directors: G. Goulding and H. J. Pimm. Registered office: 20 Glebe Farm Road, Birmingham 25.

**Grenco Scientific Glassware, Ltd.** (454,447).—Private company. Capital £500. Manufacturers of scientific glass instruments, ultra violet ray and X-ray tubes, and medical instruments, etc. Directors: R. Greenwood and Gwendoline I. Greenwood. Secretary: W. Jansen. Reg. office: 3 St. Helen's Place, E.C.3.

**Marsh Brooks, Ltd.** (454,469).—Private company. Capital £3000. Manufacturing chemists etc. Directors: J. Marsh, senior; James Marsh, junior; and Gertrude E. Marsh. Secretary: J. Harwood. Registered office: 170 Bridgeman Street, Bolton.

**Wintons (Chemists), Ltd.** (454,527).—Private company. Capital £1500. Manufacturing, analytical, pharmaceutical and general chemists, etc. Directors: Mrs. Mabel E. Portlook, Mrs. Violet H. Mantell, H. Hulbert, and Mrs. Lilian D. Bowen. Reg. office: 17 Market Square, Bromley, Kent.

## Chemical and Allied Stocks and Shares

**C**AUTION has prevailed in stock markets with Kaffirs and other South African shares marked back sharply on the defeat of General Smuts. British Funds failed to benefit from the success of the Australian 3 per cent conversion loan, and industrials moved narrowly after moderate declines.

Imperial Chemical have been steadier at 48s. 7½d., official news that the new issue is

to be on the basis of one new share (at a price yet to be fixed) for every five held being regarded favourably. With more than 50 million ordinary shares issued this would mean the issue of over 10 million new shares, or less than half previous market estimates and would raise at least £20 million for the company, the general assumption being that the issue price will be not less than 40s. and not more than 45s. Markets were afraid that if 20 million new shares were issued this would lead to a good deal of selling of the old shares in order to pay for the new. Moreover at a time when there are many new issues imminent, a big offer of this kind might have led to liquidation in markets. Moreover, on the basis of the capital issue now foreshadowed, the market believes there will be good prospects of the 10 per cent dividend being maintained.

Laporte Chemicals continued to change hands around 21s., following publication of the results, and the new shares were 2s. 3d. premium, Lawes Chemical 10s. shares have marked 13s. 6d., Albright & Wilson 5s. ordinary were 31s. 3d., Amber Chemical 2s. shares 10s. 6d., and W. J. Bush new preference 27s. 3d. Business in Fisons was again around 60s. Elsewhere, Dunlop Rubber at 74s. 3d. were steady helped by the full results, but United Molasses eased to 50s. 1½d., the chairman's statement indicating that a good proportion of profits over the next few years will have to be used in building new tankers. Babcock & Wilcox came back to 72s., British Oxygen at £5 were steady and Borax Consolidated 62s. 6d., British Aluminium 51s., British Match at 40s. eased further, awaiting the dividend.

British Drug Houses 5s. shares fell sharply to 9s. on the unexpected reduction in the dividend, Griffiths Hughes at 35s. also declined following the financial results, and the lower payment of the latter company also affected shares of others with interests in proprietary medicines, etc. Beecham deferred receded to 19s. 6d. and Aspro were 41s. 3d.

Shares of companies connected with plastics attracted only moderate attention, Erinoid being 15s. awaiting the new issue terms, while De La Rue were 47s., British Industrial Plastics 2s. shares 7s. 7½d., and British Xylonite £57. Turner & Newall at 76s. 10½d. have been fairly steady, British Plaster Board were 24s. 10½d., and Goodlass Wall eased to 37s. 3d. Iron and steels eased after their recent rise, Colvilles being 34s. 10½d., Dorman Long 31s. 6d., United Steel 29s. 7½d. Stewarts & Lloyds 56s. 4½d. and Guest Keen 49s. 3d.

In other directions, Monsanto Chemicals 5s. shares have changed hands around 61s. British Glues & Chemicals 4s. ordinary came back to 21s. 3d. Amalgamated Metal

at 21s. 9d. were unaffected by the Minister of Supply's latest statement on the request for re-opening the London Metal Exchange. Oils were prominent, buyers coming in after sharp falls which followed the V.O.C. results. Although the interim dividend on the latter was increased and there has been a big rise in profits, the final dividend has been reduced to make the total dividend unchanged at 3s. 3d. per share. This has increased the view that the big oil companies consider themselves subject to the FBI dividend limitation request. Anglo-Iranian rose to £9 1/16 on the huge jump in profits from £9,624,938 to £18,564,857. The dividend is kept at 30 per cent, over half the profits being added to general reserve.

## British Chemical Prices

### Market Reports

**A**CTIVE trading conditions persist on the industrial chemicals market, with new business well in evidence, and the export demand unabated. Consumers' specifications under existing contracts are reported to be covering substantial quantities, and deliveries are being made with fair promptness. Little of fresh interest falls to be reported in the soda products section, and the demand for the potash chemicals is sufficient to take care of all parcels that come on offer. The coal-tar products market is unaltered, both as to price conditions and output and an active demand persists.

**MANCHESTER.**—Business on the Manchester chemical market during the past week has been on a satisfactory scale, and sellers have been handling a fair number of additional home inquiries. There has been a steady movement of supplies of soda ash, caustic soda and other alkali products. The ammonia and magnesia compounds, as well as a wide range of other chemicals, has also been called for in satisfactory quantities, and in the potash section the demand for pretty well all varieties has been in excess of current available supplies. The leading tar products, both light and heavy, remain in good request.

**GLASGOW.**—In the Scottish chemical market business is still quiet, although there are signs that the volume of business is returning to proportions more normal for this time of the year. There has been no particular noteworthy demand for any specific chemical. Demand having been somewhat less, the supply position of many materials has improved a little. In the export market conditions are again active, although inquiries seem to be centred mainly on solvents and bleaching powder.

## Montecatini's Revival

### Imposing Display at Milan

**A**BUNDANT evidence of the rapid post-war reconstruction of the principal Italian chemical concern, the Montecatini Company, was provided at the recent Milan Fair, where, in a special exhibition building, the firm displayed a wide range of chemical products for agricultural and industrial use.

The rehabilitation of this company since the end of the war is remarkable. By the middle of 1945 less than one-third of the firm's 150 establishments throughout Italy were in production and those factories still active were limited in output because of the shortage of raw materials.

Despite the war's toll of plant and buildings the Montecatini Company is once again entering into large-scale production and the Milan display gave ample evidence of this revival. Separate halls in the exhibition building were devoted to chemicals for agricultural purposes; chemical research; mineral products from the company's own mines; zinc and aluminium products, dyes, pigments, varnishes, enamels, paints and plastics.

## NON-FERROUS METALS

**F**IGURES of consumption of non-ferrous metals in the United Kingdom during the first quarter of 1948, covering zinc, lead, tin, cadmium and antimony, have now been issued by the Directorate of Non-Ferrous Metals, Ministry of Supply. Total figures of the consumption of virgin metals only, including for comparison the year 1947, are as follows:—

	First Quarter 1948	Total 1947
Zinc	59,579	223,212
Lead	48,230	177,768
Tin	7,159	27,384
Cadmium	102	498
Antimony	1,332	5,302

## NEXT WEEK'S EVENTS

**TUESDAY**, June 8 to **FRIDAY**, June 11  
**Institution of Gas Engineers.** Friends House, Euston Road, London, N.W.1.  
Annual general meeting.

**THURSDAY**, June 10

**Society of Leather Trades Chemists.** (Northampton Group). College of Technology, Northampton, 2.30 p.m. Dr. I. C. Somerville: "The Development of Zirconium Tannage."

**THURSDAY**, June 10 to **SUNDAY**, June 13  
**National Industrial Safety Conference.** Royal Hotel, Scarborough. Saturday morning—A. Webster: "Chemical Hazards in Non-chemical Works."

## KEEBUSH

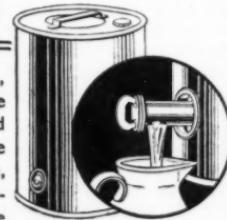
Keebush is an acid-resisting constructional material used for the construction of tanks, pumps, pipes, valves, fans, etc. It is completely inert to most commercial acids; is unaffected by temperatures up to 130°C; possesses a relatively high mechanical strength, and is unaffected by thermal shock. It is being used in most industries where acids are also being used. Write for particulars to—

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# Fluid Control - 1539 pattern . . .



Crown Copyright. From an exhibit in the  
Science Museum, London.

Bronze riveted plug draw-off cock. Hampton Court 16th Century.

Bronze cocks were first made in England in the 12th century A.D. The one reproduced above was installed at Hampton Court Palace *circa* 1539. The body of the cock is a plain hollow cylinder, slightly tapered from top to bottom inside and fitted with a correspondingly tapered hollow bronze plug, bored on opposite sides with roundways and protruding through the bottom of the body, the protruding section being lightly riveted over to prevent the plug being forced out by water pressure. This riveted plug was obviously not easy to turn.

The principle on which this ancient valve was constructed led, after two centuries of progress, to the invention and development of the Lubri-cated Plug Valve. In modern industry Audco Valves lead the world in the control of fluid, as doubtless this old plug cock did in its day.



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HYPRESEAL  
VALVES

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pressures up  
to 5,000 lb.  
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## SITUATIONS VACANT

*None of the vacancies in these columns relates to a man between the ages of 18 and 50 inclusive, or a woman between the ages of 18 and 40 inclusive, unless he or she is exempted from the provisions of the Control of Engagement Order, or the vacancy is for employment exempted from the provisions of that order.*

APPLICATIONS are invited for temporary appointments in Ministry of Supply Research Establishments in Scientific Officer and Experimental Officer Grades, in the following fields of work:—

**Chemistry:** Inorganic, Organic, Physical, Analytical, and Chemical Engineering.

The vacancies are chiefly at Farnborough (Hants); Leicester; Salisbury (Wiltz); Sevenoaks (Kent); Woolwich; Waltham Abbey (Essex) and St. Helens (Lancs.).

Candidates for Scientific Officer grades should have an Honours degree or equivalent in Chemistry or Chemical Engineering. For Experimental Officer grades a Higher School Certificate or equivalent is the minimum qualification.

Applicants must be of British Nationality. Salaries, varying according to the different grades, age, qualifications and experience, are within the following provincial ranges:—£200-£1,155 (men) and £200-£997 (women).

Application forms and salary details are obtainable on request (by postcard, quoting field of work desired and the reference number F.355/48) from Technical and Scientific Register (K), York House, Kingsway, London, W.C.2.

CHEMICAL Laboratory Assistant required by large North London Light Engineering Company. Applicants should be between ages of 21 and 30 and should be educated up to Inter. B.Sc., standard. Practical laboratory experience essential. Write, giving full particulars to Box Q/5540 A.K. ADVG., 212a, Shaftesbury Avenue, London, W.C.2.

## SITUATIONS VACANT

**CHEMIST—Organic.** Preferably hon. degree required by large firm to take charge and develop laboratory section dealing with testing plastics, materials and paints. Also be expected to carry out research on new plastic and paint applications in connection with production components. State age, qualifications, experience. WILMOT-BREEDEN LTD., Camden Street, Birmingham.

**DRAUGHTSMEN** required by London firm of chemical engineers. Applicants should possess a good technical education and preferably have experience in a process industry. Remuneration in excess of A.E.S.D. rates payable to first class men. Box No. 2666, THE CHEMICAL AGE, 154, Fleet Street, London, E.C.4.

**LAPORTE** Chemicals Ltd., Luton, require graduate wishing to specialise in Analytical Chemistry. The work will cover the development of analytical methods, particularly from a physico chemical standpoint. Age preferably under 30. Apply, giving full particulars, to CHIEF CHEMIST.

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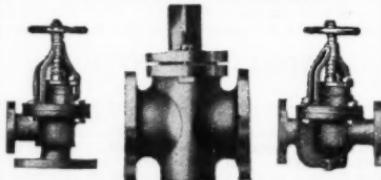


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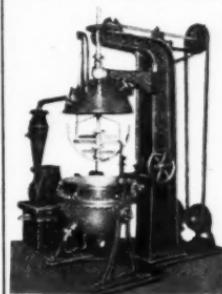
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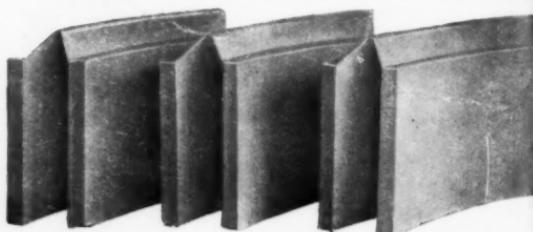
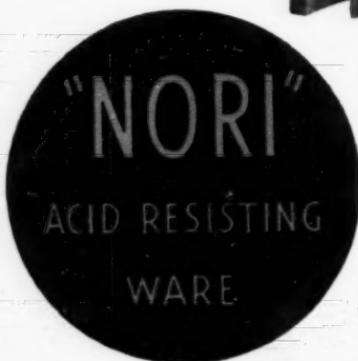
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